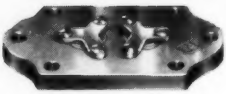
Refrigeration Service Engineer

The Industry Starts Rolling

SEPTEMBER
1945
Vol. 13 No. 9

"ANOTHER NICE MONTH, JOE; WE SURE GET LESS GRIEF AND MORE GRAVY USING THOSE *CHICAGO SEALS*"



CHICAGO VALVE PLATES

Save time and work, too. Only refrigerator compressor valve plates with removable valve seats. Sizes for most compressors.

CHICAGO GENERAL REPLACEMENT SEALS

Go on refrigerator compressors in less time, with less work, and cut down "call backs."

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CHICAGO SEAL CO.

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THE REFRIGERATION SERVICE ENGINEER. Nickerson & Collins Co., Publishers. 435 N. Waller Ave., Chicago, 44, Ill. Published monthly, Vol. 13. No. 9. September, 1945. Entered as second class matter March 4, 1938. Chicago, Ill., under the Act of March 3, 1879. Subscription in the United States, $2.00 per year; all other countries, $3.00 per year.

COLD FACTS BY ANSUL

ROMAN SLAVES TOTED SNOW FROM THE APENNINE MOUNTAINS TO COOL NERO'S WINE AND PRESERVE MEAT AND RARE FRUITS FOR HIS FEASTS.

REFRIGERATION FOR THE MASSES DEMANDS MORE CONVENIENT AND ECONOMICAL REFRIGERANTS . . . LIKE . . . **ANSUL LIQUID SULFUR DIOXIDE — ANSUL LIQUID METHYL CHLORIDE** . . IMMEDIATELY AVAILABLE.

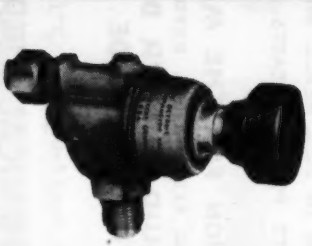
Our technical book, "Ansul Refrigerants" (3rd Edition) available upon request

ANSUL CHEMICAL COMPANY, MARINETTE, WIS.

"Now in our 30th year"

AGENTS FOR KINETIC'S "FREON-11," "FREON-12" AND FREON-22"

"DETROIT" EXPANSION VALVES
Do a Better Job



Dura-fram Automatic Expansion Valves are made in various capacities for domestic or other small boxes. Dura-fram diaphragms and Delubaloy needles and seats assure long trouble-free operation.

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FOR YOUR COPY OF THIS SERVICE HELP

This is the fourth of a series of service bulletins, published by Detroit Lubricator Company. They are printed on 8½" x 11" paper, punched for a standard loose leaf binder. Copies may be had on request. Write for yours.

DETROIT LUBRICATOR COMPANY

General Offices: 5900 TRUMBULL AVENUE, DETROIT 8, MICHIGAN

DIVISION OF AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

Canadian Representatives — RAILWAY AND ENGINEERING SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

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SPECIALTIES LIMITED, MONTREAL, TORONTO, WINNIPEG

Drying the Evaporator and Refrigerant Lines with Heated Dry Air

No. 4 of a Series

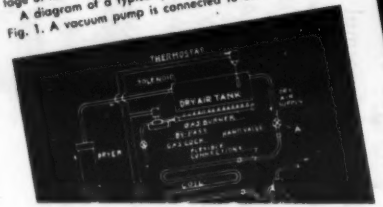
When a refrigeration system is too big to dry by placing in an oven—when circumstances do not permit heating it by means of radiant lamps for the heat and vacuum drying process, and when there is more moisture than can be taken out by a cartridge dryer, it may be dried effectively by use of heated dry air.

Hot air, or any other inert gas, such as nitrogen or carbon dioxide has the capacity to hold water as a vapor, and this capacity increases with temperature increase. Air is said to be saturated when it cannot evaporate any more water. For example air at -25° F. and at atmospheric pressure is saturated when it contains .0001968 pounds of water per pound of dry air. At 200° F. this pound of dry air will hold 2.261 pounds of water as vapor.

The coil and tubing may be dried by putting enough hot dry air through them. There are two ways—by the "pull through" and by the "pressure" methods.

The pull through method is a variation of the vacuum drying method, except that the heat comes from the air, instead of from heat lamps, or an oven. It has the advantage of making the heat available to all parts.

A diagram of a typical pull through setup is shown in Fig. 1. A vacuum pump is connected to one end and an



system, and the process is continued until drying is complete. Obtain safe maximum temperature from coil manufacture; otherwise do not exceed 175° F.

A diagram of a typical "pressure" setup is shown in Fig. 2. The tank here must be air tight, and tested to twice the pressure it is desired to use for drying. It should be equipped with a relief or safety valve set to pop at about 10% above the working pressure. A drain should be placed on the bottom of the pressure tank for removal of any water or oil which may be carried over from the compressor. Obtain safe working pressure from coil manufacture; otherwise, do not exceed 50 p.s.i. In this setup,

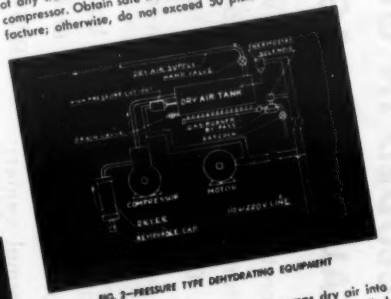


FIG. 2—PRESSURE TYPE DEHYDRATING EQUIPMENT

the motor drives a compressor which pumps dry air into the tank where it is heated by a thermostatically controlled gas burner. Obtain safe maximum temperature from coil manufacture; otherwise, do not exceed 175° F.

The compressor draws air through a calcium chloride cartridge so that it is as dry as possible when introduced into the tank. The pump should be controlled by a pressure [illegible] and by tank pressure and adjusted to hold [illegible] down through

Space limitations prevent giving the full text of this service help on this page. The service bulletin illustrated here is complete. Write for your copy.

AN *Extension* OF *Sizes* —

NOW INCLUDED IN OUR LINE OF TRIPL-SEAL DIAPHRAGM VALVES

These valves incorporate all the advantageous features of our famous TRIPL-SEAL Diaphragm Valves.

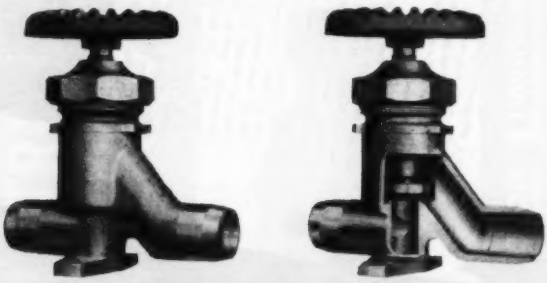
The multiple diaphragm, which has a greatly increased area, is never deflected past its normal center; thus giving it greater service life.

The stem of the TRIPL-SEAL Valve is provided with a sixty degree bevel, thus procuring the most desirable wedging action for positive and easy closing. It is manufactured from Tuf-Stuf, a strong, corrosion-resistant alloy.

The body and cap of the Valve are of forged brass to eliminate seepage and to withstand frost action.

Valves are furnished in a wide range of styles and sizes.

Order from your jobber.



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PORT HURON, MICHIGAN

Refilling

IMPERIAL *TORPEDO* DEHYDRATORS

Fast, Simple and Easy as A-B-C

A **SIMPLY UNSCREW AND REMOVE THE CONNECTION AT OUTLET END OF DEHYDRATOR.**
Note that on the Torpedo there are no bolts to remove—no flanges to take off.

B **SHAKE OUT OLD SILICA GEL, CLEAN DEHYDRATOR AND SCREEN, HEAT TO REMOVE MOISTURE, AND REFILL WITH NEW SILICA GEL.**
No loose screens to contend with on Torpedo. Finger type monel metal screen—of welded construction—is integral with outlet connection so that screen and connection are removed at the same time. Dehydrator can be heated before refilling, if desired, because no soft solder is used in construction.

C **SCREW OUTLET END BACK IN PLACE.**
No soldering required after refilling on the Imperial Torpedo Dehydrator. The job is done in short order.

YOUR BEST WEAPON IN THE WAR ON MOISTURE

Note These Other Important Torpedo Advantages:

One-piece streamlined shell provides greater strength, easier passage of refrigerant—has fewer joints.

Finger-type outlet screen provides more efficient filtering, less chance of clogging.

Copper and brass construction throughout.

Packed with Silica Gel.

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534 SOUTH RACINE AVE. • CHICAGO 7, ILL.

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FITTINGS • VALVES • FILTERS • FLOATS
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COILING, PINCH-OFF AND SWEDGING

DUPONT
Artic
METHYL
CHLORIDE
for your
99.5% PURE
DRY
UNIFORM

UNIFORM...

...for your refrigeration needs

HIGH-PURITY Du Pont Methyl Chloride is designed to meet exacting requirements.

ORDER NOW!—But don't hoard.

EMPTY CYLINDERS NEEDED—To help keep up rapid deliveries, return all empty cylinders promptly! You'll help yourself and others! E. I. du Pont de Nemours & Co. (Inc.), Electrochemicals Department, Wilmington 98, Delaware.

BUY AND HOLD MORE WAR BONDS!

DU PONT METHYL CHLORIDE SPECIFICATIONS

Purity	99.5% Methyl Chloride
Moisture	0.008% by wgt. max.
Acid as (HCl)	0.001% by wgt. max.
Residue on Evaporation	0.01% by wgt. max.
Boiling Range (760mm)	—24.6° to—23.6°C.
Color	water white, clear

DU PONT ELECTROCHEMICALS

DU PONT BETTER THINGS FOR BETTER LIVING ... THROUGH CHEMISTRY

TRACE

REFRIGERANT LEAK DETECTOR

STABILITY OF COLOR

• A refrigerant leak detector, whose color has faded after injection into a compressor, is as useless as a silent burglar alarm. Left on guard, it can't give warning!

• Highside engineers had long realized that a top product must have a stable color that would withstand the beating of an extended stay in a refrigerating unit, before getting a chance to appear and tell its story. And then it must be glaring.

• And so, when it was introduced to the critical eyes of the trade, it was appropriately named TRACE because, with its STAY-RED color, it can trace leaks of any refrigerant in any refrigerating system . . . new, old or reconditioned.

TRADE PRICES

4 oz. bottle (48 bottles to a case)	$ 1.00
1 pint bottle (24 bottles to a case)	$ 3.00
1 quart container (12 containers to a case)	$ 5.00
1 gallon container (6 containers to a case)	$16.00

Save 10% on case lots

For tough-to-spot Refrigerant Leaks

HIGHSIDE

195 VERONA AVE.

The Fight against MOISTURE

Moisture has various ways of disturbing a person's slumber. The agility of the individual with the leaky roof is to be compared only with the mental labors of the refrigeration service engineer who stays awake nights worrying about some of his moisture cases.

Neither need worry, if he is wise. The first hires a reliable roofer and the engineer turns to TZ. Both methods are standard practice.

• A TINY AMOUNT •
• A BIG JOB •
• SMALL COST •

THAWZONE
Fully Protected by U. S. Patents
The PIONEER FLUID DEHYDRANT

CHEMICALS CO.
NEWARK 4, N. J.

The Moving Dehydrant

Avoid Moisture Damage in Over-Seas Packages

Simply put a few small bags of Jay Cee Silica Gel, like the ones above, inside your container . . . wrap or seal tightly . and ship over-seas without fear of damage from "in-the-package" moisture. Jay Cee Silica Gel is an ideal drying agent . . . has amazing power to absorb atmospheric moisture. Thus the air inside of containers is kept absolutely dry and delicate metal parts are protected from rust and corrosion.

Jay Cee Silica Gel is also used in packages of foods, fabrics, chemicals, and other products. Moreover, it has wide application in the air conditioning, refrigeration, and chemical industries. Jay Cee Silica Gel is clear white; passes a rigid section test; meets exacting Government specifications; is strictly a quality product.

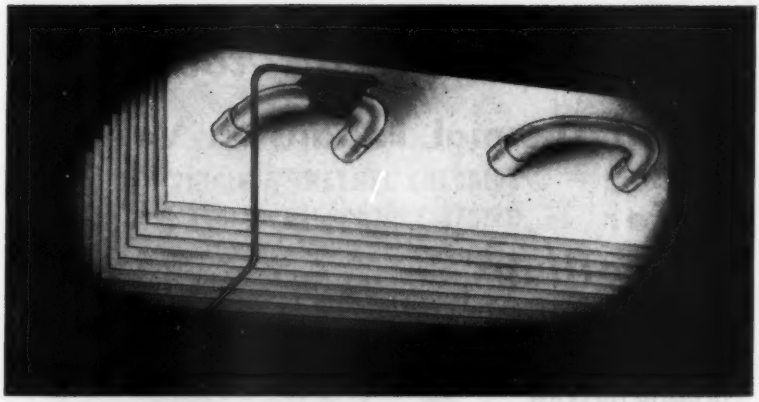
JOBBERS WANTED—There are excellent opportunities for jobbers to build profitable business on Jay Cee Silica Gel in a few territories. Write for details.

JOLIET CHEMICALS, LTD., INDUSTRY AVENUE, JOLIET, ILLINOIS

JAY CEE

SILICA GEL

A superior dehydrant

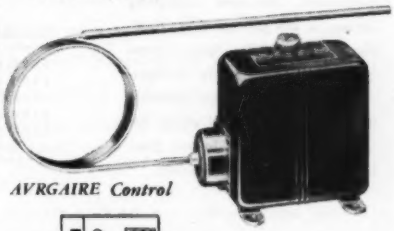


BETTER TEMPERATURE CONTROL
Results From This Application Principle

• PENN AVRGAIRE, developed especially for "above-freezing" applications, maintains *better box temperature control* and thus gives *better protection* for critical food supplies against spoilage and waste.

Why? Because AVRGAIRE employs a single-type temperature bulb which is scientifically applied so that the bulb is influenced by the *average temperature of both coil and air.* Look at the above picture . . . see how one end of the bulb is clamped on the refrigerating coil while the remainder is exposed to the air stream below the coil. The result is extremely close regulation of box temperature without irregular short-cycling of the compressor. When box load is normal, this automatic control defrosts on each operating cycle. However, when the box is loaded with warm produce and extra cooling capacity is required . . . defrosting is delayed automatically. Furthermore, PENN AVRGAIRE maintains uniform humidity and thus minimizes dehydration and "sliming" losses.

Be sure to get the whole story on this low-cost, efficient protection now. For full details on AVRGAIRE, complete with pictures and diagrams write *Penn Electric Switch Co., Goshen, Ind.* Export Division: 13 E. 40th Street, New York 16, U.S.A. In Canada: Powerlite Devices, Ltd., Toronto, Ont.



AVRGAIRE Control

PENN

AUTOMATIC CONTROLS

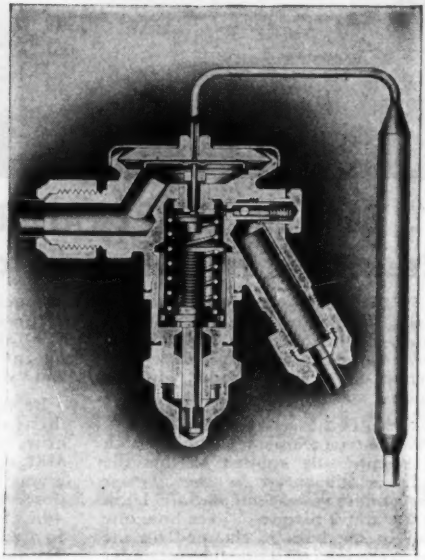
FOR HEATING, REFRIGERATION, AIR CONDITIONING, ENGINES, PUMPS AND AIR COMPRESSORS

General Controls

V-200 Thermal Expansion Valves

. . . for controlling

FREON
METHYL CHLORIDE
SULPHUR DIOXIDE



The General Controls V-200 Thermal Expansion Valve can be quickly and accurately sized to any particular installation load, by simply inserting the proper orifice cartridge on the job. It eliminates the costly necessity of carrying a large stock of complete valves of different capacity.

The unsurpassed sensitivity and dependability of this valve is achieved in part, by a diaphragm of adequate area • the well-balanced, low-rate adjusting spring • the full-opening, tight-closing valve ball • forged brass casting prevents costly refrigerant leaks • corrosion resistant internal and external parts for long life • operates in any position or ambient temperatures.

Cartridge Number	CAPACITY in B.T.U. per HOUR: FREON	METHYL CH.	SULPH. DI.
4400.1	750	1700	1710
4400.2	1500	3400	3420
4400.3	3000	6800	6840
4400.4	6000	13600	13700
4400.5	9000	20400	20500
V-200 WITH NO CARTRIDGE	12000	27200	27400

For further information, write the nearest Factory Branch, Distributor, or direct to

GENERAL CONTROLS
801 ALLEN AVENUE GLENDALE 1, CALIF.

FACTORY BRANCHES: PHILADELPHIA • ATLANTA • BOSTON • CHICAGO • DALLAS
KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
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Service Engineers Should Know . . .

"VIRGINIA" METHYL CHLORIDE IS REALLY LABORATORY TESTED

— the content of each and every container — large or small — is analyzed 3 separate times.

BOILING POINT TEST

1. A measured sample from each cylinder must be water-white in color and when boiled to dryness must record within 25/100 of 1 degree a constant boiling point of minus 23.8°C. This test detects unwanted hydrocarbons, dirt and oil impurities.

ACIDITY TEST

2. The acid content in a sample of known weight must not exceed 6 parts per million; low acidity prevents copper plating and oil sludging.

MOISTURE TEST

3. The moisture in a sample of known weight must not exceed 80 parts per million; — low moisture prevents freezing at expansion valve and refrigerant break-down.

The name "V-METH-L" on the cylinder is your guarantee of quality. Sold by refrigeration supply jobbers everywhere.

VIRGINIA Smelting Co.

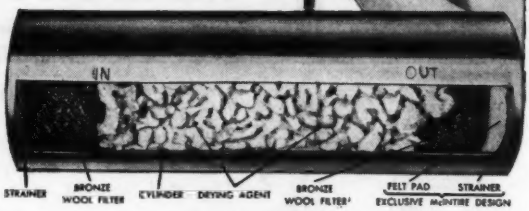
WEST NORFOLK, VA.

76 BEAVER ST., NEW YORK 5 :-: 131 STATE ST., BOSTON 4

Agents for Kinetic's "Freon-12" — "Freon-22" — "Freon-11"

It Costs Less
TO MAINTAIN
The DFN System

Inexpensive Cartridges, Faster Servicing, Make The Difference



DFN Cartridges are inexpensive because they are made for replaceable service and are protected by inserting in a heavy shell. When the DFN drier assembly is ready for a change, you merely open the flange and replace the low-cost DFN Cartridge. The DFN Shell STAYS ON for repeated use. Each cartridge change multiplies your savings in assembly time and parts.

The DFN System also saves you money because it provides complete, triple action against costly freeze-ups, clogging and corrosion! Each DFN Cartridge is a complete unit. Mechanically-packed, dust-free drying agent is hermetically sealed to give full-strength dehydration and neutralization. No danger of loose packing to cause by-passing of refrigerant. Exclusive DFN anti-sediment assembly filters to minute size. Holds more sediment and sludge without pressure drop.

Ask your distributor or write us for Catalog R-7.

WIRE MESH PRODUCTS
Monel Brass Bronze
Refrigerant, Oil and Other Solid Gases Fabricated to Specification

McIntire Connector Co.
Newark 5, N. J.

Only the **DFN SYSTEM** DEHYDRATES FILTERS NEUTRALIZES

DEHYDRATORS • STRAINERS FILTERS • NEUTRALIZERS

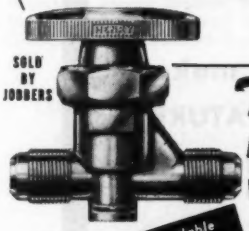
Only Henry makes a Diaphragm Packless Valve that is

NON-DIRECTIONAL

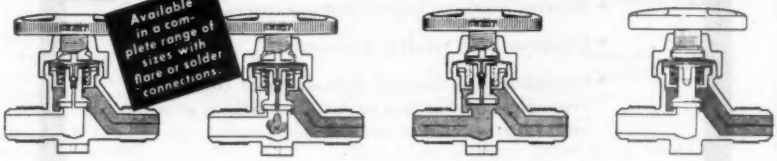
By means of a patented balancing channel in the lower valve stem, explained in detail below, the Henry Diaphragm Packless Valve cannot stick shut regardless of the pressure differential above or below the valve seat. When using a conventional valve, there is always the possibility that a valve installed in reversed position could fail to open if sufficiently high pressures should develop above the seat. The Henry Diaphragm Packless Valve, however, can be relied upon to give positive performance under all conditions of service because it is truly non-directional.

You will also like the Henry feature of having inlet and outlet ports in line on two way and three way valves. This eliminates tube bending and results in neater lines and lower installation costs.

During the war Henry Diaphragm Packless Valves have been widely favored by all branches of the armed services. It is only natural that, as our country gradually turns to the problems of Peace, this Henry Product again will be the logical choice of manufacturers, jobbers, contractors and service organizations everywhere.



The Difference Between a Henry *Non-Directional Balanced-Action Diaphragm Packless Valve and a Conventional Packless Valve*



BALANCED-ACTION VALVE IN CLOSED POSITION—High pressure above the seat, low pressure below the seat. High pressure regions are shown in color. Pressure in spring cage below diaphragms is the same as that in main passage of valve body above the seat. This is due to seepage between the lower stem and the guide. Downward pressure of the bearing plate on the diaphragms seals the upper port of the balancing channel.

OPENING THE BALANCED-ACTION VALVE—As hand wheel is turned to open valve the diaphragms, because of pressure beneath them and their own snap action, rise and expose the upper port of the balancing channel. The high pressure, shown in color, unseats ball check and is instantly released through the open channel to the low pressure region below the valve seat, thus achieving "balanced-action" by equalizing pressures.

BALANCED-ACTION VALVE IN FULL OPEN POSITION—Equalization or balancing of pressures above and below the seat, as shown in color, guarantees that this valve can never "stick shut" but will always open positively, regardless of original differential in pressures. When there is high pressure below the seat and low pressure above, the balanced valve opens easier than other types because of the light weight spring.

CONVENTIONAL TYPE WITHOUT BALANCED-ACTION—As hand wheel is turned to open valve the diaphragms rise. When the differential between high pressure, shown in color, above seat and low pressure below seat is greater than force exerted by heavy spring, stem "sticks shut"—valve remaining closed. The heavy spring required in this type of valve greatly increases diaphragm wear and strain and causes stiff closing.

HENRY VALVE COMPANY
3260 WEST GRAND AVENUE, CHICAGO 51, ILLINOIS
EXPORT DEPARTMENT, 13 EAST 40TH STREET, NEW YORK 16, N.Y. • CABLE: ARLAB

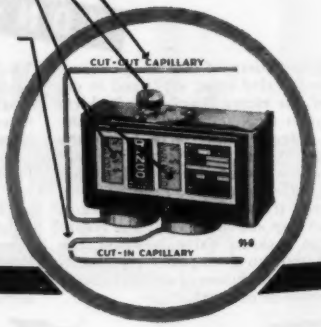
PACKLESS AND PACKED VALVES • STRAINERS • DRYERS FOR REFRIGERATION AND AIR CONDITIONING
AMMONIA VALVES • FORGED STEEL VALVES AND FITTINGS FOR OIL, STEAM AND OTHER FLUIDS

Cut-out capillary 73¼" long.

External adjustments for cut-out and cut-in.

Independent visual scales show exact cut-out and cut-in setting.

Cut-in capillary 96" long.



THESE *EXCLUSIVE* FEATURES make RANCO 91-O TWO-TEMPERATURE CONTROL *OUTSTANDING*

- **Assures uniform fixture temperatures.**
- **Uniform high relative humidity.**
- **Completely automatic defrosting of the coil regardless of weather or load conditions or a cold location of the compressor.**

Sturdily built of finest materials, checked progressively in each step of manufacture by precision inspection, this Ranco Control is a superbly sensitive and accurate instrument capable of rugged service.

For use on single unit or multiple unit systems.

For natural convection or forced convection units.

For Walk-in Coolers, display cases, florists boxes, etc.

Win the good will of your customers by installing this Ranco Control.

Ask your Ranco Jobber about this and other Ranco Commercial and Domestic Refrigeration Controls.

Ranco Inc.

COLUMBUS 1, OHIO

The Refrigeration Service Engineer

Vol. 13 No. 9

September, 1945

A Monthly Illustrated Journal Devoted to the Interests of the Refrigeration Service Engineer in the Servicing of Domestic and Small Commercial Refrigeration Systems

Official Organ
REFRIGERATION SERVICE ENGINEERS SOCIETY

The Cover

The refrigerator assembly line at the General Electric plant is again in production on the domestic refrigerator. Refrigerators shown are among the first produced by G.E. since manufacture was halted in 1942.

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EASTERN OFFICE
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Telephone Lexington 2-4816

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Here are the

24 OUTSTANDING FEATURES

built in every

PAR CONDENSING UNIT

PAR BY *Lynch*

ALL VALVES IN REMOVABLE VALVE PLATE
BALANCED FAN SPOKE FLYWHEEL
V BELT DRIVE
FINNED TUBE AND SHELL WATER COOLED CONDENSERS
CONDENSER AND DRIVE COMPLETELY SHROUDED
LOWSIDE OIL SEPARATOR ON VALVE PLATE INSIDE HEAD
OVERSIZE AIR COOLED CONDENSERS
VISIBLE BULLS-EYE SIGHT OIL GAUGE
THERMAL OVERLOAD PROTECTION
STANDARD MAKE MOTORS
BALANCED BELLOWS TYPE SEAL
COMPLETELY WIRED READY TO INSTALL
CRANK SHAFT OILITE BEARINGS
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PAR—Condensing Unit Line sold exclusively through Franchised Refrigeration Supply Jobbers!

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Manufacturing Corporation, Defiance, Ohio U. S. A.

IN THIS ISSUE—

The second "guest editorial" appears on page 21. In this, P. V. Sprout, service manager for Frigidaire, discusses the relation of service to future sales.

Another article by Harry D. Busby, managing editor of THE REFRIGERATION SERVICE ENGINEER, page 23, tells about the repair or rebuilding of hermetically sealed (welded) units and some general comments on arrangement of a repair shop.

Following the conclusion of a series of articles on servicing the Coldspot refrigerator, another similar series of articles on the Chrysler Airtemp Package Conditioner has been prepared, the first of which starts on page 27.

Realizing the importance of motors to the refrigerating machine, Bee Hive Chapter R.S.E.S. recently had J. A. McDonald speak on Funamental Maintenance and Operation of Refrigeration Motors. Text of Mr. McDonald's talk will be found on page 31.

The Industry Division of the Bureau of Census has issued a report on shipments of air conditioning and commercial refrigeration equipment during 1944. Although this represents war conditions and hence does not reflect civilian demand, it will provide factual bases for establishing reconversion policies. The report is summarized on page 33.

The rapid revocation of Government orders indicates that business will soon be on a non-restrictive basis, and that the space devoted to this subject for many months may now be considerably decreased. Reflecting the lifting of restrictions, three current orders are reviewed on page 35.

Additional practical methods used by experienced service engineers will be found in the Service Pointers Section, page 36.

Under "Questions and Anwers," page 38, problems that have baffled service men and others are analyzed and answered.

News of the atomic bomb, which burst upon the world with cataclysmic suddenness, was followed by a backwash of sensational speculation as to power possibilities from this atomic energy. A factual discussion of this angle on page 42 will be of interest to engineers and others.

A revised directory of Chapters of the Refrigeration Service Engineers Society is published in the Society Section starting on page 52. Other Society news includes a list of local conventions and items on new and old chapters.

Pushing the general trend toward raising the standards of the refrigeration service industry in the Province of Ontario, Canada, the Interprovincial Association has moved toward having the Apprenticeship Act extended to cover the industry. See page 56.

CHEAP COMPETITION

AFTER completing a routine service call the service man presented Mrs. Customer with an itemized bill, on which he listed methyl chloride at 90 cents per pound.

"Oh my! I have always paid two dollars a pound for that gas when Joe Blow serviced my refrigerator," she exclaimed, to which the service man replied, "Ninety cents is our standard price and we feel it is fair enough."

Whereupon Mrs. Customer immediately called Mr. Blow on the telephone to inform him she had learned that he had overcharged her for methyl chloride on his previous calls and that another service man had furnished it for only 90 cents a pound.

To this Joe Blow replied, "Well, if you prefer to have another company do your work and let them use cheap gas that's only worth ninety cents a pound, that's all right with me; I use only the best methyl chloride, and of course it comes higher."

Let them worry for you!

There's an ALCO Field Engineer near you to assist with your refrigerant control problems.

Each of them is a specialist thoroughly trained and qualified to work with you on the solution of tough problems.

If you are a manufacturer seeking the solution of a control problem on a new product—or a service organization that needs help on a big installation—*let our engineer worry for you.* He'll find the most practical and efficient answer.

He's as close as the nearest city shown above. Just ask us or your jobber for the Alco Engineering Data Sheet, form B-3, on which to state your problem.

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Each month a national service manager of a well known refrigeration organization will address the readers of The Refrigeration Service Engineer on a subject of timely interest.

This Month's GUEST EDITOR

P. V. SPROUT, *Service Manager*
FRIGIDAIRE DIV. GENERAL MOTORS CORP'N

Service Today for Sales Tomorrow

AS A RESULT of the winning of the war, attention is on full civilian production, and new product sales and installation and servicing of refrigeration equipment is again a peacetime business.

Although it is a perfectly natural reaction to look forward to the duties and responsibilities of tomorrow, I think we may be better prepared to meet and execute them if we would occasionally pause to reflect upon the achievements of yesterday. The "yesterday" I refer to, of course, is that difficult period of years between Pearl Harbor and the present time.

In recalling the wonderful spirit during this era of the refrigeration industry in general and of the servicing organization in particular, surely we can all take heart and face the problems of the future with full courage and confidence.

I do not think it is too much to say that this assurance can be traced largely, if not completely, to the fine cooperation of refrigeration servicing dealers and their organization of servicemen. To this loyal "army on the home-front" goes the gratitude of a nation which depended to a surprising degree upon refrigeration facilities for the protection of foods, drugs, and medicines, and for the manufacture of various implements of war.

Success Due to Servicing Dealers and Servicemen

Of the many and often seemingly insurmountable obstacles that have confronted the average servicing dealer during the past four years, none has been more trying or difficult of solution than the shortage of manpower. While the curtailment of new product sales, material restrictions, transportation difficulties, and various limitations were in themselves serious handicaps, it was the loss of experienced servicemen, particularly at a time when service work promised to double and triple in volume, that presented the greatest hardship. This meant that dealers everywhere were suddenly faced with the dual problem of losing trained personnel on the one hand, and of having to meet a drastically stepped-up service demand on the other.

That this was accomplished, and accomplished successfully, is a tribute to the courage and determined efforts of the refrigeration industry's servicing organization.

Frigidaire's War-Time Service Program

Foreseeing the approach of a difficult situation, Frigidaire took steps early in the war

to counteract in every way possible the effects of curtailed manpower. Briefly, these steps may be classified under the broad headings of securing and training new men and rendering preventive service.

Summarizing these measures, dealers were encouraged from the first to seek men employed in non-essential capacities, basing their appeal on the advantages of performing wartime refrigeration work, receiving extensive training, and becoming associated with an industry having unusually bright post-war prospects. In conjunction with this program, a correspondence course was prepared and offered gratis to all interested men, our District Offices in forty-four key cities taking the responsibility of enrolling students, furnishing lessons, grading papers, etcetera. Supplementing this activity, individual dealers were given encouragement and aid in preparing and holding night school classes in refrigeration service work. In addition, new training films, handy reference guides, visual educational aids, and home study courses were produced, while unending effort was put into the improvement and scheduling of District-held, factory-conducted field schools.

To date, records show that men in every section of the country have received either primary, advanced, or post-graduate training, or a combination of these courses, from one or more of our educational media, and that hundreds of these students are now competent, full-time employees.

As for preventive service activity, this was instituted chiefly to forestall possible interruptions and breakdowns of refrigerators and refrigeration equipment. Return-type mailing cards were prepared for the use of the dealer organization, listing a number of check-up services and inspections on both domestic and commercial equipment at a fixed fee. Mailing of these cards to users was undertaken during the winter months when service demands were lightest and was instrumental in "selling" untold numbers of users on requesting the advertised preventive service measures.

Dual Objective Accomplished

As a result, many possible mechanical failures were averted by "a stitch in time," while the heavy seasonal demand for service which otherwise would have occurred during the peak-season summer months, was leveled off throughout the year. In addition, the simple check-up work could be performed by the newer employees, thus helping to break them in and give them experience in basic service procedures and in meeting the public.

From the foregoing it is easy to see why the training program and the preventive service activity were an ideal combination to keep our servicing organization relatively well-manned and our users' equipment operating at a comparatively high standard of efficiency.

Backlog of Prospects Created for Future Business

As helpful as this program may have been in itself, however, and as carefully as the factory and District Offices worked in preparing and sponsoring it, I want to emphasize the fact that the credit for its success belongs unreservedly to the members of the Frigidaire field servicing organization. Our appreciation of the loyalty of every dealer and our gratitude to the cooperative spirit of every serviceman—whether new or pioneer mechanic—cannot be overstressed. For in meeting and overcoming the many obstacles of the critical war years, these men have built and are building a backlog of user good will that will go far toward revealing the common sense contained in our factory slogan, "Service today for sales tomorrow."

MODERN REFRIGERATION SCHOOL OPENED BY NAVY

AN ultra-modern school complete with all the latest refrigeration and air conditioning equipment is slated to be in full operation on the Norfolk (Va.) U.S. Naval Training Station by early fall. It has been in partial operation since February 5. When completed, it will have a capacity for 200 to 800 enlisted trainees and will graduate a class every week.

The school will teach two courses. One, on maintenance, operation and repair of refrigeration equipment, will last four weeks. The second, on maintenance, operation and repair of air conditioning equipment, will last two weeks. Students taking the air conditioning course must have had one on refrigeration.

Similar to one established at San Diego, Cal., the Norfolk school is new in that it is the first such school to be established independent of manufacturing concerns. It is one of the Navy's most advanced schools for enlisted men.

Students will have an opportunity to work with every type of refrigeration and air conditioning equipment used in the Navy today.

By Harry D. Busby*

Hermetic Rebuilding

THE repair or rebuilding of hermetically sealed (welded units) requiring opening of the unit is a highly specialized work which cannot be successfully handled by the average service company. Tolerances in the hermetic unit are extremely small requiring precision work in repair. Loads are closely calculated and parts are well balanced so that there are none of the excess capacities and overrated motors found in most open type units. All of which means many more tools and special test equipment to produce a satisfactory job. One cannot risk repeat calls on hermetic units. Furthermore, repair parts for hermetic units are not available and the repair shop would have to be equipped to make some parts.

A far greater amount of money must be expended in equipping a shop for hermetic repair than for repair of other units and unless the operator has a sufficient quantity of these units under repair at all times to specialize in the work, it is advisable to stay out of it entirely, sending such units as you may have in your shop to the factory for exchange or to some one of the companies who are specializing in the work and are properly equipped to handle it. This discussion, then, will not go far into the equipment needed in hermetic repairs, confining it to a reminder of some of the most important items.

* Managing Editor, REFRIGERATING SERVICE ENGINEER.

The General Electric monitor top unit is incased in the largest dome of any of the units in the field at this time. A 24 inch swing lathe is about the smallest size that will handle this unit when cutting the dome. Special chuck jaws are needed to grip the dome while cutting. Electric welding is the most satisfactory for rewelding the dome after rebuilding. The welder must be highly skilled in the work to eliminate small leaks through the weld. The weld must withstand from 300 to 400 pounds tensile strength per linear inch under operating pressure.

ARTICLE IX—REBUILDING HERMETIC UNITS—SHOP LAYOUT

This, the ninth article of the series makes suggestions for the type of shop equipment necessary to perform the rebuilding of hermetically sealed units. Shop layout from a sales and advertising viewpoint is discussed in detail in the latter part of the article.

Good degreasing and acid cleaning equipment is a "must" in hermetic work and cleanliness all the way through the rebuilding operations is highly essential to avoid future trouble. Motor stators are not available for most hermetic units, therefore the shop must be equipped to handle rewinding work. This, too, requires precise workmanship so that the amperage to the rebuilt motor under load will be exactly that to the original motor.

Preliminary Tests

Preliminary efficiency tests are desirable before final assembling and welding the unit. A large dome which can be clamped down to a base and in which the motor and compressor can be placed and connected to outside gauges and wiring is one way of making these tests. This equipment will have to be designed and built on your order or perhaps in your shop.

An evacuating pump for removing oil and gas before opening, a drying oven and vacuum pump for final drying, and a spray

Fig. 1. Rebuilding Hermetic units requires special equipment such as shown in part of this service shop.

booth and good paint spraying equipment for refinishing the domes are essential. A drill press, arbor press, and a grinding stand will find many uses and should be part of the equipment.

Final Testing

For final testing, it is desirable to duplicate as nearly as possible the toughest conditions under which the unit may operate when returned to the customer. A "hot room" or test room maintained at the maximum temperature encountered in the locality will produce these conditions. The rebuilt unit is placed in a test cabinet which will cool during the test. An on and off recorder, a temperature recorder, ammeters, and wattmeters are the test instruments needed.

There are numerous other tools and equipment needed in the work but those mentioned are the most important and the most expensive; indicating to some degree how much is involved in the repair of hermetic units. Again, it is recommended that this work be left to the manufacturer or to the few independent shops throughout the country specializing in the work.

Location of Equipment

The greatest single contributor to personal safety and good workmanship in the repair shop is good lighting, preferably daylight. Because most of the work will be done on the work bench, it is always advisable to place the bench where the greatest amount of daylight is available such as under the skylight or in front of windows. It is equally important from the standpoint of appearance and efficient working conditions to allow plenty of aisle space on all sides of the bench so that it is accessible from all sides.

Therefore, it is recommended that the bench be placed out in an open space rather than against a wall or where this is not permissible, one end should be against the wall rather than one side. If the bench is placed near a window, arrange it so that the glare from the window will not strike the eyes or cause shadows on the forward part of the work; thus, one end toward the window provides better working conditions than one side. When daylight is not available, use indirect rather than direct artificial lighting with not less than 200 watt bulbs, spaced about 8 ft. apart.

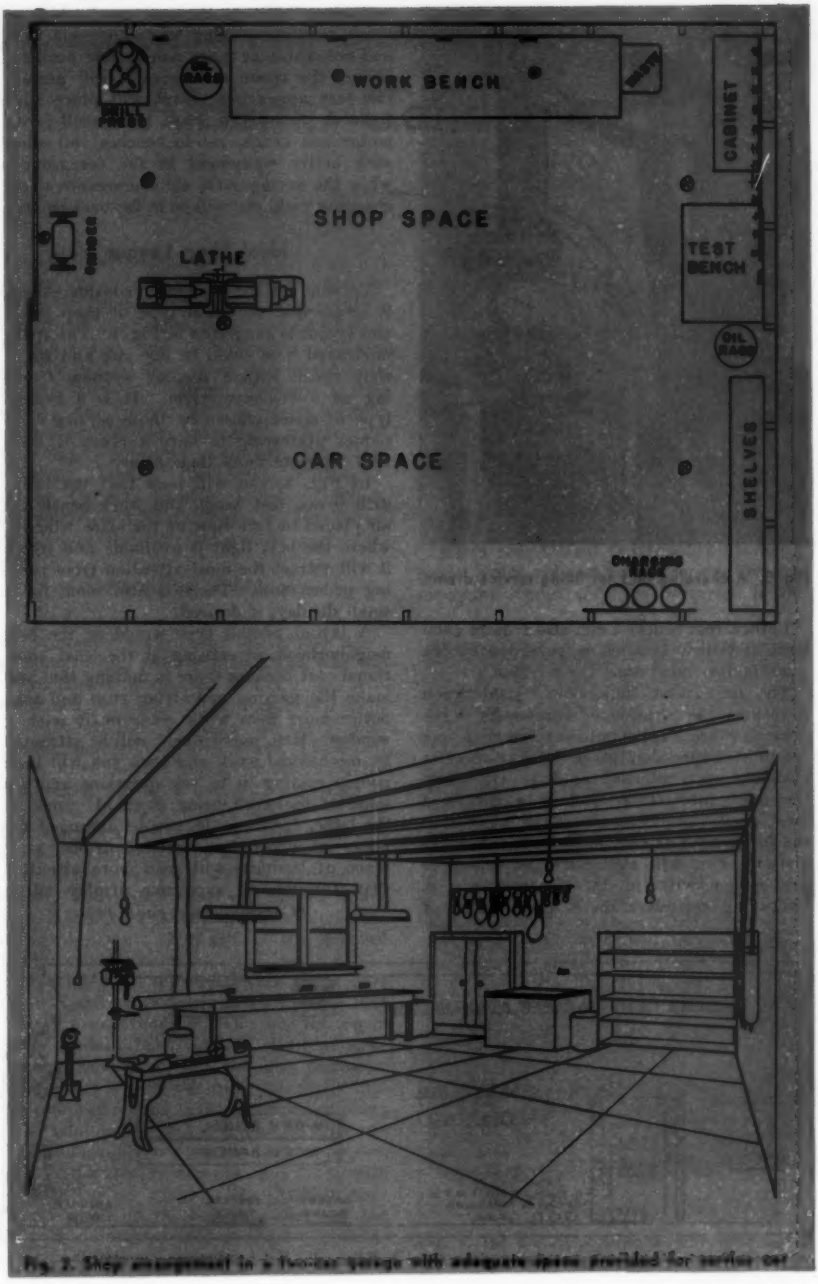


Fig. 2. Shop arrangement in a two-car garage with adequate space provided for service car

Fig. 3. A charging rack for filling service drums.

Lathes, test benches, etc. also require good light and their location is governed by the same factors mentioned for benches.

The next most important consideration governing the location of equipment is the general overall appearance of the shop and the first impression given the prospective customer upon entering the shop. Obviously the most interesting, best appearing and most used equipment should be located in the foreground or section first viewed by the visitor. This will also place the center of greatest activity in the foreground. A tempering consideration is convenience of and accessibility to the equipment which at times requires placing the equipment in a less noticeable or more practicable position. Where the space arrangement will permit, the best appearing layout will place such items as the work benches, lathe, drill press, motor test bench, run-in benches and other such active equipment in the foreground, while the drying oven, air compressor, drum charging rack, etc. will be in the background.

Ideal Shop Layout

To sum up the foregoing considerations, it seems that the ideal type of shop space and layout is suggested in Fig. 4. The space portrayed here could be any size and shape shop space with a display window fronting on a business street. It is a typical type of space chosen by those service companies preferring to have a place of business separate from their home.

In Fig. 4, you will note that the lathe, drill press, test bench and work bench are all placed in full view of the show window, where the best light is available and where it will attract the most attention from passing pedestrians. There is also room for a small display, if desired.

A layout of this type would be the best neighborhood advertising at the least additional cost because there is nothing that will make the passing pedestrian stop and take notice more than work going on in a show window. Men, particularly, will be attracted by mechanical work and soon you will have people coming in to ask questions and see more of the work being done. If work on the lathe, for example, can be arranged for hours of greatest pedestrian traffic, your place of business will gain more attention than through an expensive display ad in

(Continued on page 44)

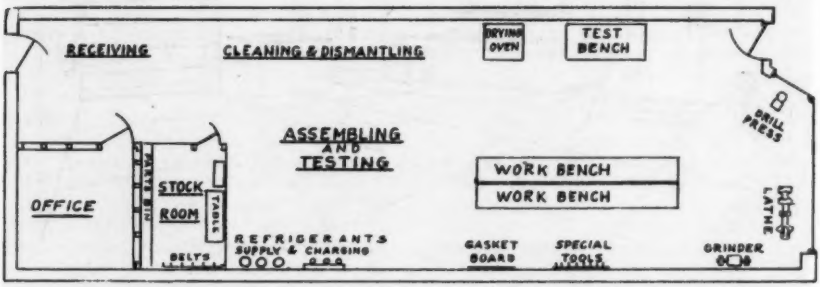


Fig. 4. A typical shop layout in a store building divided by a center partition.

Installation and operation of Airtemp Conditioners

(Article One)

PROVIDING the reader with practical service and installation information on domestic and commercial refrigerating equipment is an important function of THE REFRIGERATION SERVICE ENGINEER. Continuing the series of articles previously published, Chrysler Airtemp Package Conditioners are treated in this series. Other service articles have extensively covered the following equipment: Coldspot, Copeland, Crosley, Dayton, Electrolux, Fairbanks-Morse, General Electric, Gibson, Gilfillan, Grunow, Ice-O-Matic, Majestic, Mayflower, McClellan, Norge, Servel, and Stewart-Warner.

This is the first of a series of articles published by permission of Airtemp Division, Chrysler Corporation on the package conditioners for stores and residences. Service instructions and detailed descriptions of the mechanical and electrical parts will be presented for the benefit of those who are called on to service these units in the field.

Description of Models

Airtemp's first unit in the self-contained or packaged series was the Model 3-SC, meaning 2 hp., self-contained, and was followed closely by the unit 3-SCA, 3 hp., self-contained A model. The compressor type was the ACH-3, meaning Air-temp compressor, hermetic—3 horsepower. These unit series were mainly display models with the compressor having a manifold discharge in the form of an external semi-circle tube that connected the discharge from each cylinder. No oil separator was provided. The compressor was fitted with an external oil cooler. The control panel was the stationary type bolted to a mounting frame above the condensing unit. The cabinet was finished in blue crinkle enamel.

Model 3-SCB, released in the latter part of 1936 and produced in 1937, was the first factory production unit. This was the sequel to the model 3-SCA. An ACH-3 type compressor was used, and the gas discharge from the cylinders was built internally into the compressor body and bottom cover plate. This eliminated the external discharge manifold employed on the A compressor unit. This compressor was also fitted with an external oil cooler. The ACH-3 compressor used on the 3-SCA model and the ACH-3 compressor used on the 3-SCB model are not interchangeable.

Factory Changes Are Made

When the ACH-3 compressors of the A model series are sent to the Service Department for repair, they are converted to the

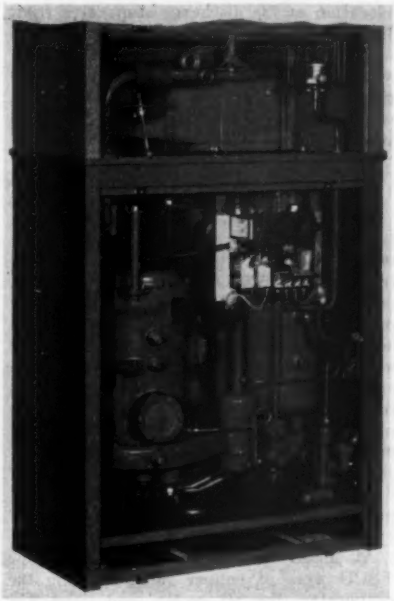


Fig. 1. The 3-SCD conditioner with type 3-HC compressor unit.

ACH-3 B type and are returned to the field with the companion suction and discharge stop valves, discharge spacer, studs, and gaskets. The suction and discharge lines on the field unit must be measured and cut to fit the new stop valves and compressor assembly. This compressor conversion is not based on the standard exchange compressor basis, but is subject to a special adjustment feature.

The ACH-3 compressor on the 3-SCB unit was equipped with an oil separator and the control panel was made more compact and hinged to provide service facility. The cabinet finish was similar to the model 3-SCA, being blue crinkle.

Model 3-SCB was in reality the forerunner of the self-contained unit—the first to be actively produced and the first to receive responsive field acclaim.

Some Units Interchangeable

Model 3-SCBX was introduced in the spring of 1938 and also employed the use of the model ACH-3 compressor. Compressors on model 3-SCB and 3-SCBX units are interchangeable. The major change on the 3-SCBX unit over the 3-SCB was in the relocation of the discharge stop valve from the discharge line and oil separator assembly to the condenser. Discharge line and oil separator assemblies on the two units are, therefore, not interchangeable. The cabinet finish was the blue crinkle, with late production run models of two tone tan.

Later Model Changes

Model 3-SCD was the sequel to the 3-SCBX unit and was released in 1941. The two-tone cabinet finish was carried over from the 3-SCBX. A model 3-HC compressor meaning 3 hp.—hermetic compressor was released. This compressor had several inner mechanism changes and the oil cooler was changed from the external type previously mounted on the side of the compressor to a location in the oil sump of the compressor bottom cover plate. Compressor models ACH-3 and 3-HC are not interchangeable.

A new type evaporator was also incorporated with a corresponding multi-outlet expansion valve.

All model units up to and including the 3-SCD were of copper fabrication on the evaporator, the oil cooler, and condenser water coil. Copper bellows had been used in the suction and discharge lines, rubber in

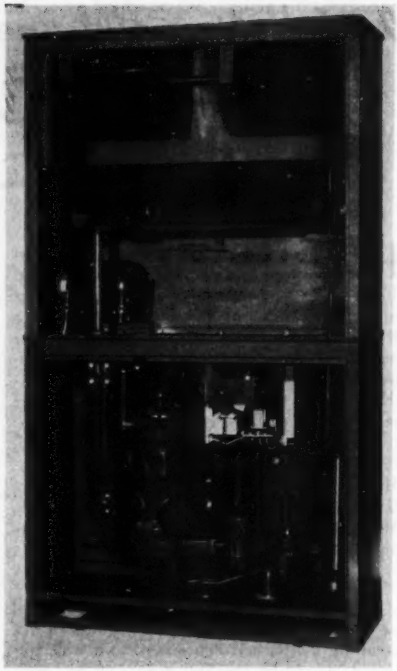


Fig. 2. The 5-SCA conditioner with type AHC-5 compressor unit.

the compressor mountings and rubber hose on the connections from the condenser to the oil cooler and from the oil cooler to the waste line.

The Airtemp war unit required the changeover from copper to steel. This materialized in 1943 and called for a change in the evaporator, expansion valve, compressor mounting, condenser, oil cooler, and the integral piping connections. No new model number was released.

Summarizing the 3 hp. series, there has been five distinct model changes with, of course, the copper to steel changeover, on the 3-SCD.

Residential Conditioners

The Chrysler Airtemp residential type unit produced only in the 3-hp. series has followed the model nomenclature of the packaged air conditioner. This unit is designed for application with the current gas or oil-fired forced air furnace model that

meets the equipment capacity. Most of the component assembly parts of the 3-hp. packaged unit are incorporated in the residential unit, the only difference being a reduced upper cabinet size and relocation of the evaporator coil. The blower unit on the furnace is common to both summer and winter air circulation.

Models released to date have been the 3-RSCA, meaning 3 hp., residential, self-contained, A series which was the first residential unit and was a companion to the packaged 3-SCA. Compressor type ACH-3 was used, identical with that employed on the 3-SCA. Subsequent models followed the pattern of the 3 hp. self-contained, i.e., the 3-RSCB, 3-RSCBX, and the 3-RSCA, ACH-3 type compressors were used on the 3-RSCB, 3-RSCBX, and 3-HC type on the 3-SCA. Interchangeability of compressors coincide with the explanation on the packaged series.

The first 5-hp., packaged unit, known as the model 5-SC, meaning 5-hp., self-contained, was released in the spring of 1938 and was followed by the current model 5-SCA in 1941. Cabinet finish on the 5-SC was blue crinkle and two-tone brown on the 5-SCA. Compressor type ACH-5 was used on the 5-SC and 5-HC on the 5-SCA. These compressor types are not interchangeable.

Copper to steel changeover on the 5-SCA was made at the time of the innovation on the 3-SCD. No new model assignment was released. Compressor types for the copper and steel units are therefor not interchangeable.

INSTALLATION POINTERS

It may be necessary to partially disassemble the unit in order to pass through small doorways or a narrow stairway. To do this, remove the compressor compartment door and return air grille and filter from the front of the unit. Disconnect the liquid line at the expansion valve flange 18. (Note: These numbers refer to Fig. 3 unless otherwise indicated.) Disconnect the power bulb to the expansion valve at the mounting on

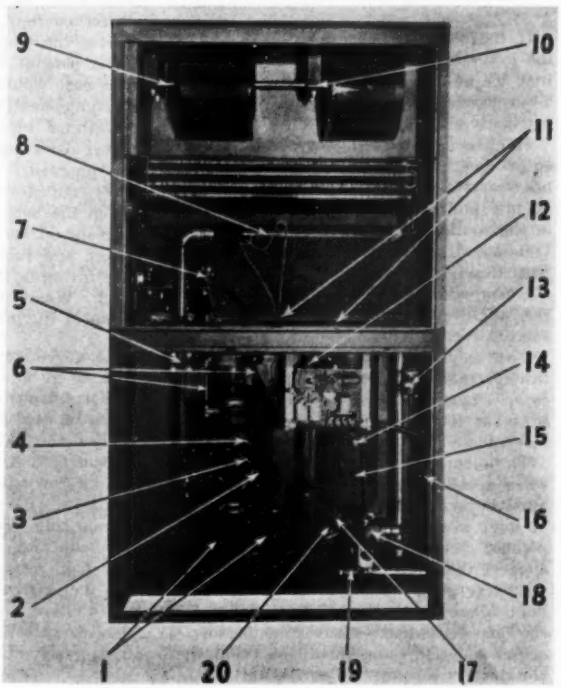


Fig. 3. Descriptive photograph showing location of the parts referred to in the text.

1. Shipping bolts
2. Discharge gauge connection
3. Suction gauge connection
4. Oil pressure gauge connection
5. Suction line flange
6. Shipping bolts
7. Fan motor oil cup
8. Thermostat bulb
9-10. Blower bearings
11. Drain pan bolts
12. Discharge shut-off valve
13. Expansion valve
14. Relief valve
15. "Snifter" valve
16. Electrical junction box
17. Charging connection
18-19. Water inlet and outlet
20. Liquid shut-off valve

the suction line. Disconnect the thermostat bulb at the bracket, 8. Disconnect the suction line at the flange, 5. Disconnect the cable to the fan motor at the panel board. Disengage fan belt from motor pulley.

Plug all open lines with clean corks, linen cloths or chamois skin. Remove 4 nuts and washers from the bolts in each corner of the cabinet, which hold the blower and coil compartment in place. Then lift the upper half of the unit off, protecting the expansion valve and tubing.

Location

The location of the unit is usually chosen at the time the sale is made. Consideration must be given the following:

1. Condition of the supporting floor.
2. Adequate water supply.
3. Design of supply water and drain piping.
4. Adequate electrical service.
5. Design of ducts, if used.
6. Accessibility for lubrication and mechanical adjustment.

If the unit has been disassembled, move the lower half to the desired location. See that the unit is level and solidly supported. Then assemble the upper half exactly as originally received.

If care is exercised, very little air will enter the lines. However, if it is thought necessary to purge air, open the liquid valve slightly and purge through the loose flange in the suction line.

Remove the two shipping bolts, 6, which pass through lugs in the front and rear of the compressor top cover plate and engage the angle iron support frame above the compressor.

Two shipping bolts, 1, pass horizontally through the bottom of the compressor crankcase, engaging the channel-shaped cross brace at the rear of the compressor. Remove these bolts and spacers.

The plenum chamber and discharge grille, when specified, are shipped separately and must be assembled to the unit on the job. If duct work is connected to the unit, the plenum chamber will not be required. We suggest that ducts be *not* connected to the discharge grille outlet in the plenum chamber. Make the duct connection direct from the blower outlet. Canvas connectors or sound isolation pads should be used where the ducts are connected at the unit.

Plumbing

Supply and return water piping must be properly sized to deliver adequate water to the condenser. Local water temperatures and pressures must finally determine the size of the supply pipe. Water usage and ratings are shown on the Airtemp Price and Data Book.

The water supply connection is made at the fitting, 18. Install a cleanable strainer and hand shut-off valve in the supply line at the unit. If water pressures are in excess of 70 lbs., a pressure reducing valve must be used.

The return line connection is made at the fitting, 19, and should run to an open drain or as indicated by local codes and ordinances. If the return line is 20 to 25 feet long and empties into a drain higher than the connection on the unit, a shut-off valve should be installed in the line at the unit.

Condensate Drain Connections

The condensate drain line should be made up of 1 inch threaded pipe or copper tube. Conensate may be taken from the upper drain pan only, by virtue of a tee fitting just below the upper drain pan, on the right hand side of the unit. The drain pipe in this case would pass through the knock-out opening in the right side panel and the length of pipe extending on down to the lower drain pan would be removed and the tee plugged.

If condensate drain connections are made from the bottom drain pan, the drain piping should be laid before the unit is set in place and this piping will be connected to the fitting in the center of the bottom drain pan. Wherever possible, it is preferable to connect the lower drain pan.

Steam Coil

Two steam coils are available if the unit is to be used for heating as well as cooling.

For the 5 hp. unit, there is a two-row steam coil, Airtemp Part No. 1032858, and a one-row steam coil, Airtemp Part No. 1032878. Part numbers for the 3 hp. unit steam coils are 1032894 and 1032893 for the two-row and one-row steam coils respectively. Coil ratings and capacity will be shown on the Airtemp Specification Sheet.

In either case, if steam coils are used, the blower belt must be changed to a special heat resistant belt, Airtemp Part. No. 103-

(Continued on page 44)

Fundamental Maintenance and Operation of Refrigeration Motors[1]

By J. A. McDonald[2]

THE electric motor is universally in use, so all servicemen must have a working knowledge of it. A few fundamental principles, if understood and remembered, will go a long way in helping to solve trouble when trouble arises.

Maintenance and Repairs

When you get a piece of material from a manufacturer, it is usually in good condition. Maintenance is the small attention you give it to keep it in service and running all the time. Obviously, the equipment will not be out of service as long if attention is paid to the details of maintenance as it would if neglected until it has failed entirely and shut down. Modern electric motors give some signs of trouble before they develop serious failures. Usually if we take steps in time, this slight trouble can be corrected to prevent the more serious trouble. If a motor gets hot, it will usually run hot for a while before injury occurs. A trained man can usually detect the causes and correct it before something more serious results. Therefore, every serviceman should read and study enough about electric motors to detect these symptoms.

A great many minor motor troubles are caused by over-lubricating. In old days no one thought of oiling a motor. As a consequence, bearings ran dry. Later, maintenance men carried an oil can and gave the motor a shot of oil every time they passed by. This resulted in bearings being flooded and an oily atmosphere being drawn through the motor.

Over-oiling Causes Failure

There is a definite path of ventilation through a motor for cool air from outside can be drawn into the motor and out through the exhaust. This ventilating path also draws in dust and dirt, and if there is an oily atmosphere around the bearings from over-oiling, some of this oil vapor is drawn into the motor. The oil forms a base for dust which lodges on the insulation and soon results in a carbonized path across the windings, causing the motor to fail. This is true of many motors, and especially true of stoker motors because of the coal dust.

In the last few years, there has been a marked changeover to ball bearings. In greasing a ball bearing, never put in more than half as much grease as the ball bearing will hold. If jammed full of grease, the bearings cut a channel in the grease and then quit lubricating, whereas one-third or one-half as much grease will be distributed around and carried by the ball to do the work it was put there for. *Do not over-lubricate motors.*

Protective Controls—Essential

Most electrical equipment that we will have anything to do with consists of two parts—motors and controls. Some people take the attitude that the motor is of prime importance and the control of secondary importance. I believe the proper attitude is to consider that the control is of at least the same importance as the motor. After the motor has stopped, there must be some kind of device to tell the motor when to start and that is what the control does. The first of these controls was the old knife-blade switch and for many years this was satisfactory until people realized how dangerous and cumbersome it was. Later came the push button, snap and tumbler switches. Built into many of these later controls are different types of protective devices. For the first instant after starting, a motor uses five or six times as much current as while running under load. For example, a 5 hp. 220 volt motor draws twelve amps while running under full load. If one tries to start it through a twelve of fifteen amp fuse the first inrush of current would blow the fuse. To prevent this, one of two things must be done, either start the motor through a special fuse or have a fuse heavy enough to take the starting load of the motor. The latter,

(Continued on page 44)

[1] *A talk given at a meeting of Beehive Chapter Refrigeration Service Engineers Society.*

[2] *Sup't. Service Shop—General Electric Company, Salt Lake City, Utah.*

however, is not practical inasmuch as such a heavy fuse would provide no protection for the motor, but would burn it up before the fuse would blow out. Another method would be to use a double throw switch that would start the motor on the line or through a heavy fuse and then, when up to speed, the switch is thrown to the other side and run through a fuse selected for the motor.

Thermal Protection

Today we almost exclusively use a thermal protective device. The principle of this thermal protection which is built into almost every control is fundamentally the same. We all remember learning in high school physics that metal when heated will expand. Using this principle, two pieces of metal with different coefficients of expansion are fastened together. When heated through the same number of degrees of heat, one will expand more than the other. At ordinary temperatures, the two strips of metal in this bimetal assembly will be the same length, but when heated, one tries to get longer than the other, causing the strip to curl over. When the strip curls, it trips a switch breaking the circuit to the motor.

Motor Types and Sizes

Three different types of motors are used to drive refrigeration compressors. These are: split phase ac. motors, larger single phase integral hp. motors and three phase ac. motors.

Before considering the electric motor it is essential to have a knowledge of the operation of a generator, as every motor is in a sense a generator. When the electrical circuit is closed and the motor begin to turn, besides taking current from the line the motor also generates current. The electrical pressure generated by a generator or motor is voltage or EMF. The voltage generated by the motor flows in an opposite direction and opposes the current coming in from the line. Just the difference between the current in the line and the opposing current generated by the motor gets into the motor. If it were not for this fact that the motor is a generator it would not be possible to have motors. The counter-voltage or counter-electromotive force acts as a break to hold out the excess current that would otherwise come into the motor and burn it up.

The split phase ac. motors are the 1/6, 1/4, 1/3 or fractional motors that are so common. Inside that motor are two windings—a running winding and a starting winding. These small single phase motors have a peculiar characteristic somewhat like the one-cylinder gas engine—they have a dead center where they won't start. In these small single phase motors when just the starting winding is burned out, it can be turned by external means to get it started, then it will come up to speed and function perfectly. The purpose of the starting winding is to give it that starting push, and when 75 or 80 per cent of the full load speed is attained, a centrifugal switch takes the starting circuit out of the line.

If you are having trouble with this type of motor do the following: Check voltage first. Be sure the fuse is not blown. Check to see if the starting circuit is open. Take off the belt and spin the motor. If when spun in either direction the motor will start and come up to speed, the starting winding is out. If the motor offers resistance when spun in one direction, however, the starting winding is still good.

Check the bearings. Worn bearings will also cause trouble. If the bearings wear down, the rotor rubs on the inside of the stator, developing friction which will burn out the motor.

Also check to see that the belt is not too tight or the motor out of alignment. In diagnosing motor trouble, always endeavor to get a story from the person operating the machine. If it has been repaired by someone, there may be any number of things wrong, but if it is a new machine, there are a few things that will be wrong.

Repulsion-Induction Motors

Repulsion-Induction Integral Motors. The principal difference between these motors and the fractional horse power split phase motors is the use of an armature with commutator and brushes. Wherever there is friction, there is wear and the majority of service calls necessary to repair this type of motor will be to replace worn brushes or brush holder springs that have lost their tension.

Three-Phase Motors

Three-phase Induction Motors. This is the most foolproof motor made—no commutator, no brushes, no starting switch, no mechanical connection between the line and the motor, the power is taken from the magnetic field only with no physical connection. There are millions of these motors in use today and

(Continued on page 44)

Shipments of Commercial Air Conditioning and Refrigeration Equipment—1944

A REPORT has been issued by the Industry Division of the Bureau of the Census on the shipments of air conditioning and commercial refrigeration equipment by manufacturers during 1944. Shipments of both complete units and components for unitary equipment are included in the report which represents the second complete survey of the air conditioning and commercial refrigeration industry since the last census of manufactures which related to the year 1939. Last year, in order to provide Government and the industry with a factual basis for establishing sound reconversion policies, a survey of shipments during the last pre-war year, 1940, was taken.

Scope of Survey

The statistics in this report cover all types of air conditioning and commercial refrigeration equipment normally sold as standard items and the more important types of components and accessories for such equipment. The report does not include certain types of air conditioning and commercial refrigeration unitary equipment specifically designed for special uses. Also excluded are a number of the less important, in terms of dollar value, components and accessories such as switches, dehydrators, accumulators, valves and surge drums and tanks.

The scope of the 1944 survey on air conditioning and commercial refrigeration equipment is similar to the 1940 survey except for the addition in the 1944 survey of farm and dairy milk coolers to the list of products covered.

Coverage

The companies included in this report account for approximately 99 per cent of the total value of air conditioning and commercial refrigeration equipment shipped during 1944. Because of the large number of products on the schedule form, some of which are produced in only a few plants, this coverage figure cannot be applied to each type of refrigeration and air conditioning equipment. For some products the coverage is lower than 99 per cent, but it probably does not fall below 90 per cent for any product. In the case of almost all products the coverage is at least 95 per cent.

All the companies that were covered by the 1940 survey on air conditioning and commercial refrigeration equipment were canvassed in the 1944 survey. The 1944 figures are based on the report of 212 manufacturers. This number is 83 less than the 295 manufacturers whose reports were tabulated in the 1940 survey. Most of the 83 manufacturers reporting in 1940 but not in 1944 filed statements that they did not produce or ship any air conditioning or commercial refrigeration equipment during 1944. Many of these manufacturers indicated that they would return to the production of such equipment as soon as limitation orders were relaxed or war contracts completed.

Shipments of some of the more important complete self-contained units were reported as follows: walk-in coolers, 1,117 units, valued at $1,119,389; reach-in refrigerators, 19,445 units valued at $5,133,941; display cases, 8,446 units valued at $2,088,828; frozen food cabinets, 2,277 units valued at $745,896.

Special Refrigeration Units and Systems for War Purposes

This report covers standard items usually produced in fairly sizable quantities. Although during the war period, refrigeration manufacturers produced mainly for the Army, Navy, or Maritime Commission, for most items their shipments could be reported according to the product classifications on the M32A schedule form. With perhaps minor changes in design, a reach-in refrigerator produced for the Navy is similar to a reach-in refrigerator manufactured for non-military commercial uses. However, in some cases a manufacturer produced some special type of refrigeration equipment for war purposes which did not correspond to any of the product categories listed on the schedule form. These items are included in this report under the category "Special refrigeration units and systems for war purposes."

It must be emphasized, however, that this category does not include all refrigeration equipment produced for the armed services.

Analysis of Data

During 1944 the refrigeration and air conditioning industry shipped 142,011 units of commercial refrigeration and air conditioning unitary equipment, compared with the 338,796 units of similar items shipped during 1940, the last year for which complete statistics for the industry were collected. In addition, the companies reported that during 1944 they shipped 11,015 special refrigeration units and systems for military purposes.

The dollar value of the air conditioning and commercial refrigeration unitary equipment shipped during 1944, including the special military items, was approximately 53 million dollars. In 1940, the value of such unitary equipment shipped totaled about 75 million dollars. The 1944 figure includes two and one-half million dollars for absorption systems, for which the companies were not required to report number of units.

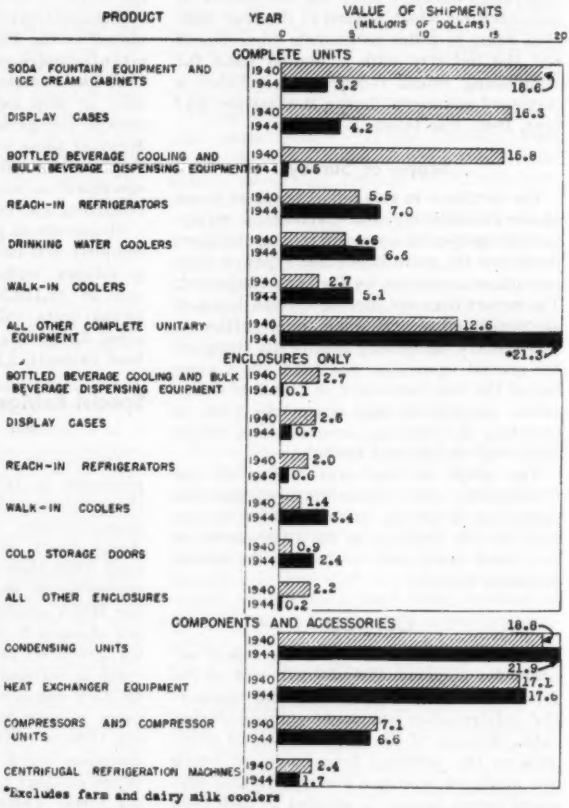
In addition to the complete units, the manufacturers also shipped 16,742 enclosures for mechanical refrigeration equipment and non-mechanical units, and 25,091 cold storage doors. The value of these enclosures, non-mechanical units, and cold-storage doors shipped during 1944 amounted to over seven and one-half million dollars.

In terms of dollar value of shipments, the reach-in refrigerators were the most important class of equipment with a value of slightly under seven million dollars, and drinking water coolers were second with a value of approximately six and one-half million dollars.

In terms of number of units shipped during 1944, the most important item was drinking water coolers. Of these, 55,895 units were shipped during 1944. Other important items were farm and dairy milk coolers, with 28,552 units shipped and reach-in refrigerators, with shipments of 24,300 units. These values and units are for complete units only, self-contained and remote, and do not include the value and number of enclosures sold separately.

The shipment pattern of unitary equipment during 1944 differed significantly from that in 1940. In 1940 the major shipments were of display cases, beverage coolers, and ice cream cabinets. Also in 1940 a large

(Continued on page 44)



*Excludes farm and dairy milk coolers

Comparison of shipments of complete units, enclosures only and components and accessories for air conditioning and commercial refrigeration equipment 1940 and 1944

Government Bureaus—*News and Rulings*

RULINGS and announcements issued by Government Bureaus of interest to the refrigeration service industries are summarized below. With the rapid revocation of government orders it is quite likely that there will be no further need for this department. Only the essential facts of the following orders are given. Those who desire more complete details are advised to write the proper government agency.

* * *

CMP Reg. 9A and Order P-126 to Expire September 30

THE effect upon repair shops of the revocation of numerous War Production Board regulations, and of the revised priorities system outlined under Priorities Regulation 29, was summarized August 30 by the WPB.

CMP Regulation 9A, used by industrial repair shops and by electricians, electrical contractors, plumbers and many other kinds of civilian repair shops, is still in effect with its assigned allotment symbol and preference rating, WPB pointed out. The same is true, WPB said, of Order P-126 for repair shops servicing commercial and industrial refrigerating and air conditioning systems.

Through September 30, 1945, ratings under these two regulations may be used to order items deliverable before that date. On September 30, however, these regulations, along with many others, automatically expire, and the unfilled rated orders automatically become unrated orders.

Since rated orders must be honored before unrated ones under the conditions specified in Priorities Regulation 1, WPB said it may be to the advantage of shops doing maintenance and repair work to place rated orders now, deliverable on or before September 30, for hard-to-get items such as new fractional horsepower motors and certain refrigeration repair parts.

Likewise, CMP Regulations 5 and 5A, two of the pincipal WPB maintenance and repair regulations, remain in effect until the end of September, WPB said. Contractors have the privilege of using their customers' ratings, as specified in those regulations, for rated orders on hard-to-get items, deliverable on or before September 30, for maintenance and repair work for their customers.

Distribution of Household Refrigerators Still Restricted

DOMESTIC mechanical refrigerators are still not available to the average civilian, the War Production Board explained August 21, even though the production control upon the manufacture of these refrigerators has been revoked. These refrigerators have been reserved for distribution only to such high essential users as the armed services, hospitals and laboratories. Even though the need for the military has diminished in some respects, it will remain high in others because of the needs of American occupation troops in the Pacific and Europe. Until production is sufficient to meet these needs the distribution order (L-5-d) cannot be revoked, and refrigerators in the frozen inventory can be released only pursuant to authorization by WPB, as before.

* * *

Trucks, Other Items Released—Industrial Construction Unlimited

THE manufacture of trucks was removed from government control on August 20 along with more than 200 other civilian items. Truck tires continue rationed but such control is expected to end with the present year at the latest. All delivery restrictions are scheduled for cancellation on November 1.

On August 21, industrial construction was exempted from control under Conservation Order L-41 by the issuance of Direction 7 under the order. It is no longer necessary to secure WPB permission for construction of or on a factory plant or unit where the unit is to be primarily used for the manufacturing, processing or assembling of any goods or materials (other than as retail service work).

The following kinds of work are considered manufacturing, processing, or assembling goods or materials and units primarily engaged in such work are exempted from L-41 under this direction:

Food processing plants, slaughterhouses, commercial food freezing plants, commercial cold storage warehouses, commercial food packing plants (whether on or off farm), bottling plants, grain elevators, canneries (but not butcher or grocery stores or locker plants serving individual customers).

(Continued on page 44)

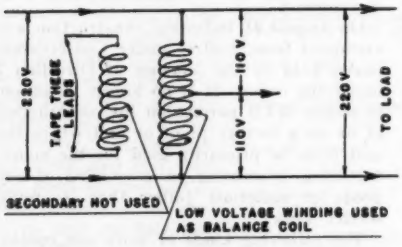
SERVICE POINTERS

Practical Solutions of Your Service Problems

THIS department is an aid to service engineers who are seeking new devices or methods to improve their work. All the service pointers have been supplied by the subscribers. THE REFRIGERATION SERVICE ENGINEER invites readers to submit "down-to-earth" practical service and installation information. Five dollars will be paid for each pointer published. Every service engineer has one or more "kinks" that have proved useful in every day practice. Here is your opportunity to exchange service pointers with the other fellow and earn $5.00 for the information. Write up your idea today and mail it to the *Service Pointer Editor*.

ECONOMICAL TRANSMISSION FOR REMOTE CIRCUITS

WHEN it becomes necessary to supply a 110V light and power load 400 to 500 feet from a 110-220V distribution panel, the voltage drop is a large factor unless the line conductors are unusually large. A two wire 110V line would have a high voltage drop when single phase motors are started. A 3 wire 110-220V line would do the job with less copper than a 110V 2 wire circuit. Still less copper would be required by use of a balancing coil as illustrated here.



The 220V 2-wire line is run to a balancing coil or distribution transformer as shown in the drawing. If a transformer is used, connect the 220V line across the low voltage winding and bring out a neutral wire from the center tap. Tape the leads from the high voltage secondary coil carefully to prevent dangerous shock. This arrangement will permit transmission of the power with about 25 percent of the copper required to run a 110V circuit to do the job. *Submitted by Peter Douglas, Naperville, Ill.*

GRUNOW OBSTRUCTIONS

INDICATIONS of obstructions are: a hot motor, a cold condenser, meter above normal pressure, and the evaporator not cold.

Special tools are: A block of 4x4 lumber 8½ inches long, two inches of ¼ inch tubing with a ¼ inch flare nut on one end and an auto tire valve on the other, and a tire pump.

Procedure: Stop machine and disconnect the liquid line at the back of the cabinet. Air should rush in as the joint is broken. Connect the short-tube flare nut on the liquid line and place the carrene meter discharge line in a clean quart glass jar Pump air into the system. If everything is O.K. carrene will flow into the jar unless the meter is the float type and contains insufficient carrene to lift the float. Permit all carrene to flow into the jar so it can be examined for moisture and sludge.

If nothing flows into the jar, open the meter purge valve and progress up the system opening every joint until the pressure is released. The obstruction is behind the opening that released the pressure. Disconnect the suction line at the compressor and pull the mounting board out of the cabinet far enough to expose the machine, setting the free end on the 4x4 block. The obstructed part can now be tested with air pressure from which each end with the proper fittings and the tire pump. Clean or replace the obstructed part and repeat original test. On top-mounted units, use a charging kit valve to connect the pump to the evaporator for the test. High head pressure with no obstruction indicates a low side leak. *Submitted by C. L. Carter, Pueblo, Colo.*

COTTER PIN TOOL

I HAVE had considerable difficulty replacing cotter pins in the switch of Delco motors until I took an old pair of ling-nose pliers that had worn smooth and filed a notch in the end of them. It will make a nasty job easier as the cotter will stay put and not fly out just as you are ready to put the switch back together. It also puts a worn out tool back to work as you will find lots of things that it will hold better. *Submitted by O. D. Morris, Gainesville, Florida.*

DEFECTIVE FLOAT WORKS AUTOMATIC EX. VALVE

HERE in Maine we service many milk cooling installations. We recently encountered a cooler where the high side float was leaking. This unit has the high side float permanently attached to the condenser. Not having a condenser-float assembly, we cut the liquid line between the float and evaporator and installed an automatic expansion valve. The system was then overcharged to keep the float open and permit feeding of liquid to the expansion valve at condenser pressure. The automatic expansion valve was then adjusted to properly refrigerate the coils. The system has given good service since the change was made. *Submitted by Ed. Bondway, Portland, Maine.*

CLEANING WATER COOLED CONDENSERS

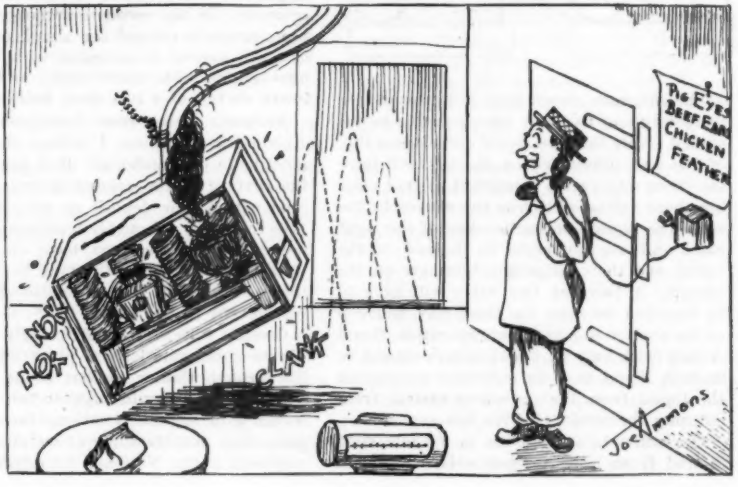
A METHOD of blowing mud and dirt out of water cooled condensers without the bother of bringing an air compressor to the job I find very successful, is to disconnect the water valve from the condenser, then install a length of tubing with a gauge teed in and a hand valve from the compressor discharge service valve to the water outlet on the condenser. Now start the condensing unit without the water flowing through the condenser until it has a pressure of approximately 200 lbs. Open the compressor discharge valve about half way, then open the hand valve installed in the line to the condenser. It is advisable to have a short length of hose from the water inlet of the condenser to a bucket or sewer outlet to catch the mud and water. After doing this it is well to flush the condenser with the full water pressure. The amount of gas lost by this operation is not noticeable. *Submitted by G. C. MacDonald, Sidney, N. S., Canada.*

REMOVING OIL FROM EVAPORATOR

ON MANY low-side float installations such as apartment house refrigerators or ice cream cabinets, the brackets and bolts are badly rusted. Removing the evaporator would involve considerable time.

Oil can be removed from the evaporator tubes by first evacuating the evaporator and then removing the float header. Flare one end of a two foot length of one-quarter inch tubing and insert the other end through a rubber grommet or wrap rubber tape around it to seal the tube tightly when it is inserted in each evaporator tube. Place the tube into the evaporator tube and blow the oil up into the float chamber with air or refrigerant pressure. The oil can then be removed from the float chamber. *Submitted by Elmer L. Fair, U. S. N., Norfolk, Va.*

I don't think there's much wrong—Just needs a little gas



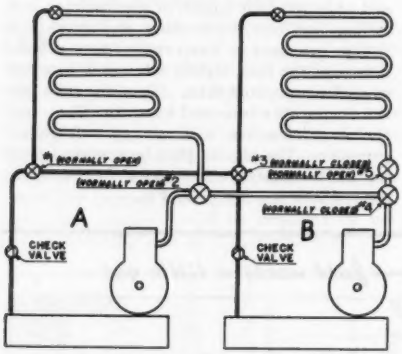
QUESTIONS AND ANSWERS

On Problems of Servicing, Installation and Maintenance of Household and Commercial Refrigerating Equipment—Send Your Problems to the Question Box.

CROSS CONNECTING UNITS

QUESTION 701: I have two 2 hp. units that set end to end on the same platform. Each unit has about the same Btu. connected load. My customer would like to have the units connected together by valves so in the case of breakdown of one unit, refrigeration could be supplied to either one of both coils as required. How should these units be connected?

ANSWER: In order to cross connect the two units, the suction and liquid lines will have to be cut at some convenient location where the valves to be installed will be accessible.



The diagram shown here indicates where three-way and two-way valves are to be installed. Note that the liquid and suction line of the unit illustrated on the left will have the three-way valves connected so that closing these valves will close the circuit to the coil. The liquid and suction line of the right hand unit are connected to the run of the valves and the cross connections are on the branch. A two-way line valve will have to be installed between the three-way and coil on the suction line to permit operation of coil A only with unit B. Check valves should be in both liquid lines as indicated to prevent the liquid from the operating system from entering the receiver of the idle system.

Operation is as follows: to operate coils A and B on unit A, open valves 3 and 4. Valves 1, 2, and 5 are normally open; to operate coil B on unit A, open valves 3 and 4 and close valves 1 and 2. Valve 5 is normally open; to operate coils A and B on unit B, open all valves; to operate coil A on unit B, close valve 5 and open all others; to transfer refrigerant from one system to the other, close the receiver valve on the operating unit. This will permit the liquid to feed from the other receiver until sufficient charge is in the operating system.

HIGH HEAD PRESSURE AFTER LONG SHUT-DOWN

QUESTION 702: I have a ten-ton Kelvinator air conditioning unit to service. This machine has been out of service for some two seasons for lack of F-12. Recently, I put in 49 lbs. of F-12. After adding refrigerant I am having trouble with overload kickout from high head-pressure. Apparently the water cooled condenser is sufficient. I found the cooling unit was flooded with oil so I pumped down the system and pulled a low vacuum which did not remove oil from the system.

The machine will run approximately 5 minutes and kick-out on overload control. Apparently the solonoid valve is functioning correctly. In my estimation the system has been properly purged for air. I might add that this system is equipped with a centrifugal pump with water tanks and cooling tower on top of a two story building.

ANSWER: From your description of the Kelvinator operation, I believe the trouble must be in the condenser. It is possible that the surface of the condenser coils are covered with a lime deposit or micro-organism growth that is effectively insulating the condenser. I presume you have checked the water temperature in the tank to determine the pressure-temperature relationship of the refrigerant to the water.

Cooling towers are particularly susceptible to contamination by plant and animal life growth similar to that found on stagnant water. I would suggest you treat the water with regular solutions for this purpose. One manufacturer of water-treatment products is the National Aluminate Corpo-

ration, 6228 W. 66th Place, Chicago 38, Illinois.

It might also be advisable to check the water circulation through the cooling tower and pan outlet back to the tank.

CHECK GRUNOW TRANSFORMER

QUESTION 703: On my leave from S.R.U. at Bremerton, Washington, I was called on to look at a M 61 Grunow. The system refrigerates as it should but the unit gets extremely hot after running a short time. I dismantled the compressor, checked all parts but found nothing out of order. I reinstalled the unit with the correct amount of gas and oil. The electrical as well as mechanical parts were perfect, I checked the working pressure which was 3.5 inches vacuum and the power supply registered 112 volts. The relay would not drop so the unit would run on starting winding. If the relay was held down for about 15 seconds, the motor would run as it should until the cycle started again. My diagnosis is that the motor is drawing too much current. Can you give me the approximate resistance of the windings and the starting and running current draw?

ANSWER: I have searched through all the Grunow manuals we have here but find no reference made to the amount of current the M61 unit draws. The motor operates as a two-phase motor through the condenser and starting winding. The main winding is in the circuit at all times when the thermostat switch is closed.

If there is an excessive load on the motor the overload trip button should kick out. From the manner in which you describe the operation, it would seem that no overload exists. You might check the transformer for proper voltage delivery.

The procedure to make a voltage check is as follows:

1. Disconnect the red transformer lead from the capacitor terminal.
2. With an auxiliary line cord, connect the line voltage to the black and green leads.
3. Check output voltage with a voltmeter having at least a 600 volt scale.
4. Voltage check across the black to white transformer leads (with line voltage of 115) should be from 391 to 409 volts.
5. Black to red voltage should be from 575 to 600 volts. If these voltages are within 2% for a 60 cycle transformer, it can be assumed the transformer is operating correctly.

LEAK CAUSES HIGH HEAD PRESS

QUESTION 704: Recently I had a complaint on a multiple hook up where 12 low side float Frigidaires were hooked up to one condensing unit. The janitor had stopped the machine over night to defrost. When the unit was started the next morning the high pressure switch began to kick out at 160 pounds head pressure. I kept holding the switch closed for a few minutes at the time until some of the evaporators began to freeze and the pressure went down to 140 pounds which was too high for sulphur dioxide as the temperature was about 90 degrees. I want to know what to do in a case like this and what caused the high pressure. What is the best way to defrost a hook up of this kind? What is the best replacement for the float on the old Kelvinator low side float when they are defective?

ANSWER: The only obvious reason for high head pressure is air in the system. This presumes that the condenser is adequate for the job. If the unit is air cooled with ambient air at 90 degrees, the head pressure will be around 100 pounds per square inch. The head pressure will vary with the back pressure; probably going as high as 130 pounds when the back pressure is 10 pounds per square inch.

In all probability, the system is slowly taking in air and it will continue to do so until the leak is found and repaired.

The system can be purged into a solution made of one pound of lye to one gallon of water. Purge from the top of the compressor at the condenser service valve after the unit has been idle from ten to fifteen minutes. Purging should be done slowly to permit the lye water to absorb all the sulphur dioxide that accompanies the air.

Defrosting is best accomplished by turning the system off just as the janitor did in this case.

The replacement of Kelvinator low side floats can be obtained from your local Kelvinator distributor. It is best to use the Kelvinator float in Kelvinator evaporators.

L. E. Brand
Steubenville, Ohio

I can't wait for the next issue of THE REFRIGERATION SERVICE ENGINEER. No publication can compare with the valuable information it supplies. Had it not been for this magazine, lots of Coldspot refrigerators would not be running in my locality.

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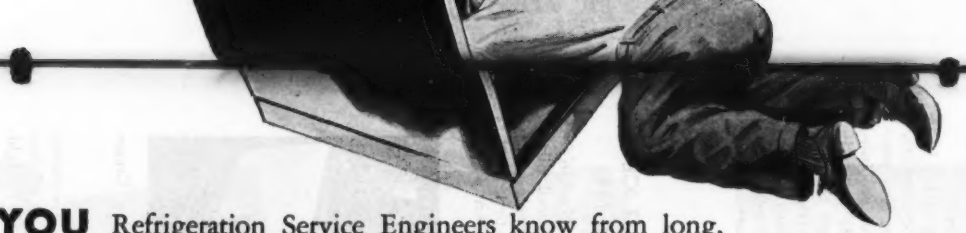
THERMOSTATIC EXPANSION VALVE FOR
THOSE TIGHT PLACES WHERE Other
Valves HAVE TO BE MOUNTED JUST SO....



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POWER FROM ATOMIC ENERGY

AT THE risk of being tagged as a skeptic or old fogey, we say keep the engines and other power equipment in good operating condition; you will be using them for a long time. The "startle them with science" type of writers had a field day when the atomic bomb was announced. It seemed that just around the corner is a little box to be installed in every home which will release nuclear energy in useful form to do everything from air conditioning to feeding the cat. A slightly larger box will provide the energy to operate an industrial plant. A few Nervous Nellies even began to view the whole development with alarm. "It might put men out of work."

When the physicists who know something about the progress in atomic research had their opportunity to speak they made no promises about constructive use of the new development in the near future. Then the whole matter began to take on a less hysterical tone.

The atomic bomb was outstanding in a war which brought many breathtaking advances in the destructive arts. It shortened the war and prevented many casualties among the men of our armed forces. Everyone who had any constructive part in its creation deserves our grateful praise.

Peace Is Different

No one will wish to count the cost of the atomic bomb in dollars. It amply paid its way. When we discuss nuclear energy as an industrial force, however, that is another thing. Cost is then the prime consideration. An explosive is not a good or economical source of power. No one has ever sought to adapt TNT to driving a refrigerating machine.

In the present case it is hoped that the investigation which succeeded in producing a startling new explosive may be useful in the ultimate production of a new source of useful energy. Now that the uses of publicity in connection with the former have been served, that investigation will probably revert to the realm of secrecy dictated by national security.

So far there has been no announcement that any coordinated attempt will be made to develop the industrial power side of this investigation. The large group of scientists who collaborated in the war work will soon be back on individual phases of their own investigations.

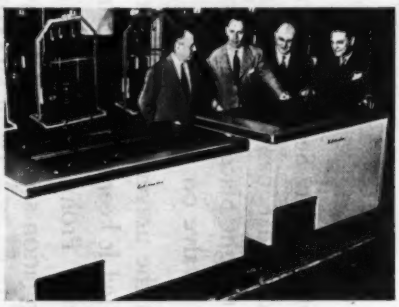
It is to be hoped that the coal miners have not been too much impressed by the fanfare about the replacement of their product—likewise the oil producers. Apparently they are still sending coal and oil to market. The only way they can be hurt is if they try to hedge by purchasing stock in the "Super Atomic Research and Development Institute, Inc." or some other get-rich-quick scheme of equally nebulous future.

Meanwhile let us in the refrigeration industry continue to keep our engines, motors, and other power equipment in the best possible condition. What is worn out or obsolete should be replaced as quickly as possible to be ready for the increased postwar demand for refrigeration. In refrigeration equipment too there have been many important advances during the past few years. At last, everyone now has an opportunity to utilize them.—E. B.

S S S

KELVINATOR BUILDS FIRST ICE CREAM CABINETS SINCE 1942

THE Kelvinator Division of Nash-Kelvinator Corporation has produced pilot models of the first ice cream cabinets to be built by the company since April, 1942. Powered by Kelvinator's Polarsphere sealed



Pilot Model of New Kelvinator Ice Cream Cabinet.

condensing unit, the new cabinets are shown on the assembly lines at Detroit with officials who inspected the first models. Left to right are C. T. Lawson, vice president in charge of Kelvinator sales; E. R. Legg, assistant general sales manager of Kelvinator; R. E. Dunbar, factory manager, and D. H. Carter, ice cream cabinet sales manager.

COMPACT *Temprite* LIQUID COOLERS

Compact Temprite liquid cooling units have an extremely wide range of applications for both immediate use and postwar design. Temprite's instantaneous cooling feature and super-sensitive control valve results in a unit capable of producing the maximum efficiency under all operating conditions. 18 Models are available with Capacities ranging from 3 gallons per hour up to 2200 gallons per hour.

Write us today for specifications. Units are available for military and essential civilian needs.

TEMPRITE PRODUCTS CORP.

Originators of Instantaneous Liquid Cooling Devices

45 PIQUETTE AVENUE DETROIT 2, MICHIGAN

GOING INTO BUSINESS FOR YOURSELF

(Continued from page 26)

the local paper. People will remember that they have seen in your repair shop months later when their refrigerator develops trouble but they would very likely forget an ad.

If service is what you have to sell, put it up in front where people can see it. If you are engaged in both sales and service, place both in front as suggested in Article VII, THE REFRIGERATION SERVICE ENGINEER and give them equal prominence. Your office is not for sale, so put it in the rear.

The suggestion for location or equipment in the foregoing will apply equally as well where a two car garage or any other type of space is used, except there will be no display window to consider. There will be visitors to your shop, however, and the layout and general appearance should be pleasing to them.

S S S

MAINTENANCE AND OPERATION OF REFRIGERATION MOTORS

(Continued from page 31)

if kept properly oiled, they will require very little service work.

From a maintenance standpoint, "cleanliness is truly godliness." Whenever you go into a service shop where everything is in order and the equipment well kept and clean, you may expect the work of those servicemen to be as thorough and well-done as their housekeeping, but when you go into a shop that is untidy and ill-kept, the chances are their service work would be done in somewhat the same fashion. And whenever your customer is around and you have an opportunity to talk with him, teach him too to take care of this equipment and keep it clean.

S S S

GOVERNMENT BUREAU RULINGS

(Continued from page 35)

Units which are not industrial. Retail service establishments performing services for individual customers are not considered as engaged in manufacturing, processing or assembling goods or materials and construction on such units is not exempted from L-41 by this direction. Among these are frozen food locker plants, retail or wholesale service establishments, warehouses and restaurants. The $5,000 annual limitation under L-41 continues to apply to these.

SHIPMENTS OF AIR CONDITIONING AND REFRIGERATION EQUIPMENT

(Continued from page 34)

number of air conditioning units, both store type and room coolers, were shipped. During 1944, shipments of room coolers were too small to be shown in the report without disclosing the operations of individual companies.

Shipments of Condensing Units

During 1944, manufacturers of components for commercial refrigeration and air conditioning equipment shipped 184,727 condensing units, exclusive of units purchased for resale. In addition, they produced 16,231 condensing units for incorporation into unitary equipment of their own manufacture. Producers of commercial refrigeration and air conditioning unitary equipment purchased 67,984 condensing units during 1944. Thus, there were 116,743 condensing units shipped in 1944 that were not incorporated into the unitary equipment shipped during that year. Only 7,280 of these were exported. The remainder were sold either as repair parts, incorporated into refrigeration and air conditioning systems erected at the site by contractors, or sold to other manufacturers for incorporation into types of refrigeration equipment not specified on the schedule.

S S S

INSTALLATION AND OPERATION OF AIRTEMP CONDITIONERS

(Continued from page 30)

3048 (5 hp unit) and Airtempt Part No. 1083414 (3 hp. unit).

The steam coil rests on top of the evaporator and the supply and return lines are taken through the right-hand side panel of the unit. The steam coil is not designed for a one-pipe steam system, but may be adapted to a one-pipe system by running a separate return, properly vented, to the main return line. Steam piping should be installed in accordance with local codes ordinances, and approved practice.

A low pressure, float drip trap must be installed in the return line at the unit. If used in conjunction with a high-pressure steam system, a pressure-reducing valve must be used.

(To Be Continued)

Road-sign for future opportunities

Refrigeration service engineers will have opportunities for plenty of business, with condensing units again available for civilian applications.

There'll be old machines to be replaced, of course . . . and there'll be new installations, too, to serve the needs of business and industry.

Be sure to make the most of these profit opportunities... plan to recommend G-E Condensing Units for both new and replacement jobs. The G E name will win customer *acceptance*—G-E performance assures customer *satisfaction*. G-E Condensing Units are built in sizes from ⅛ to 125 hp. —there's a size for every refrigeration application. They're rugged, reliable, efficient!

General Electric Company, Air Conditioning Department, Section 5719, Bloomfield, New Jersey.

BUY... and hold... VICTORY BONDS

GENERAL ELECTRIC

YAKIMA DEALER ADVOCATES NEIGHBORHOOD LOCATION

LOCATING in a neighborhood shopping center is ideal for a new sales and service setup, says H. H. Snodgrass of Yakima, Washington. Situated a long distance from Yakima's main business district, Snodgrass opened his shop at Eleventh Avenue and Pine Street, in the midst of a neighborhood shopping center.

"You are out of the high rent district in a location like this," continued Snodgrass. "And there is adequate parking facilities, which helps a great deal in attracting the customer. We are drawing our customers from blocks around."

But some things are to be considered before deciding upon a neighborhood location. Is the site a natural shopping center? Snodgrass shares the location area with a Marketeria, a drug store, beauty shop, two barber shops, a 5 and 10 cent store, two groceries, a lawn mower-grinding shop, a modern cafe-tavern, a shoe repair shop, and three service stations. Thus it is easy to see that the Snodgrass location is a "natural" for drawing customers. Consumers visit this shopping center from an extensive area.

The parking facilities are extremely favorable here. Located on a corner of a residential street, it is as easy to park for Snodgrass customers as it would be for them to visit friends.

A street car line operates on Pine Street, thus affording residents of the area Snodgrass intends to serve, daily opportunity of observing the new establishment and having the fact impressed upon their minds that a convenient place has been opened for repairing and servicing their refrigerators. The same applies to the main Eleventh Avenue frontage. This is an important traffic arterial for Nob Hill residents going home from downtown, and the continual flow of probable customers will gradually come to know that Snodgrass has a shop there to serve them.

Snodgrass opened his shop on July 6, 1945. He ran a classified ad in the newspaper for a few days and he says he has all he can do just from returns from that small advertisement. Handy with tools, he constructed needed benches for his service shop when he first occupied the premises. The location was a former dry cleaning establishment.

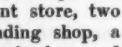
When merchandise is available, Snodgrass will add sales to his present service facilities, and feature a general line of appliances, fans, and quick freeze units.

In the building front, a future salesroom is separated from the service shop by a partition. Two windows provide adequate display facilities.

Repairs are handled for all household appliances, pump motors, and other small motors.

"I'm building up the business now," explains Snodgrass, "I put out good work and satisfied customers will tell others of their satisfaction while they, themselves, will come back."

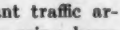
The formula for securing a good business location, then, appears to be . . . take a good look around, if it looks good—take it!



BOOK REVIEW

THE ELECTROLYTIC CAPACITOR. By Alexander M. Georgiev, member, Institute of Electrical Engineers. Published by Murray Hill Book, Inc., New York, N. Y. 191 pages. Illustrated. Heavy cloth binding. Price $3.00. For sale by Nickerson & Collins Co., Chicago, Ill.

This book covers the design, construction, operation, testing and uses of dry and wet electrolytic capacitors and condensers. It is one which brings the literature of the electrolytic capacitor right up to the minute, and in so doing, presents a practical compilation of information on this device from its inception to the present date. It covers every phase of the subject from a fundamental discussion of capacitors through the development and manufacture of the electrolytic capacitor to the practical application and the servicing of equipment which utilized this type of capacitor.



FREEZE FIRST-OF-THE-SEASON VEGETABLES

FIRST-of-the-season vegetables are usually preferable for freezing, advises Dr. Donald K. Tressler, Foods Consultant to the General Electric Co.

Early summer vegetables grow very rapidly because of long hours of sunlight and the moist soil ordinarily found at that season of the year. These conditions usually produce vegetables which are of a very high quality. Their color and texture is often superior to those harvested later in the season, he said.

THERMOBANK

by KRAMER

With the THERMOBANK a zero degree system is just as automatic as a 40° system.

It defrosts itself without the use of electric heaters, brine spray or water spray.

Actual THERMOBANK installation in Locker Storage Plant of 500 locker capacity.

Write for Bulletin TV34 N

KRAMER TRENTON COMPANY

Trenton, New Jersey

QUARTERMASTER CORPS DEVELOPS PORTABLE REFRIGERATOR

THE Quartermaster Corps of the United States Army, in cooperation with the General Electric Co., has developed a portable, all-purpose, medical refrigerator for the storage of whole blood, biologicals and perishable foods and drugs, for use by the Medical Corps.

The refrigerator is extremely lightweight, being made of aluminum throughout, and weighing only 175 pounds complete. Its outside dimensions are 33 by 24 by 38 inches and it can be readily carried by two men using the carrying handles provided on either side.

View of portable refrigerator developed for Medical Corps of U. S. Army.

One of the features of the refrigerators is that it maintains two distinct temperatures in two different compartments. One compartment contains five removable aluminum baskets which have a net usable capacity of 2½ cubic feet. These baskets may be used for storing forty eight bottles of whole blood which must be kept between the limits of 35 and 50° F. There is also a center compartment which contains a removable tank, used for storing vaccines which will maintain a temperature of approximately 15° F., independently of the other high temperature compartment. It has hollow walls filled with a fluid with a low freezing point, enabling the tank to be removed from the refrigerator while defrosting, yet maintaining an inside temperature of below 25° F. for an hour or more. This feature also permits the removal of the tank to points some distance away from the refrigerator for the administration of the vaccines without danger of their spoilage.

AIR CONDITIONED TROLLEY COACH INTRODUCED IN ATLANTA

A SIGNIFICANT "first" in modern urban transportation is the Carrier-equipped fully air-conditioned trolley coach, now under construction in Worcester, Mass., and soon to be delivered to the Georgia Power Company for experimental use in Atlanta.

With all-weather comfort its keynote, the new coach, first of its type to be built exclusively for intra-city transportation, will maintain the appearance of the standard trolley-bus now in widespread use. The air-conditioning equipment, designed by and installed under the supervision of Carrier engineers, has a cooling and dehumidifying capacity equal to that used on latest design railway cars, and twice that required for inter-city busses.

The reason for this large capacity is the high concentration of passenger load and frequent opening and closing of doors, according to Henry G. Strong, director of transportation air conditioning sales of the Carrier Corporation, Syracuse, N. Y.

The system consists of two Carrier air conditioning units and one Carrier Freon compressor. The compressor is driven by a 600-volt D. C. motor, receiving current from the trolley system. Two separate air-cooled condensers are used, each provided with fan and motor. Cooling capacity control is automatic. The driver can use the fans of the air conditioning units to provide ventilation without the use of the refrigeration machinery, if he so chooses.

Mounted over the roof of the coach, the air conditioning units are held by steel framing which carries the load to the side walls or posts. Cork pads isolate the unit from the frame, and there is no direct contact with the roof at any one point.

The compressor-motor assembly is mounted on a rigid structural steel frame, welded, and attached to the coach underframing members through vibration eliminators. The assembly is protected from splash by a sheet metal housing which covers the bottom and sides. Air is forced through this enclosure, entering a louvred opening at the motor end and escaping along the sides and at the compressor end. This air flow is set up by the forward motion of the coach.

Ducts passing down both sides of the coach at the ceiling distribute the air through perforations at the rate of 800 cubic

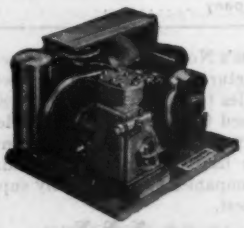
Customer: *"What's going on here?"*

Manager: *"Our fish are* really fresh *since we installed our new Kelvinator Condensing Unit!"*

The outstanding leader in commercial refrigeration for 30 years . . . Kelvinator Condensing Units give more economy, more performance . . . *more dependability!*

That's why, when specifying condensing units . . . service men say "Kelvinator!"

Kelvinator distributors and zone offices stock a complete line of refrigeration supplies. See them for your installation material such as tubing, controls, dryers, etc.



Kelvinator

DIVISION OF NASH-KELVINATOR CORPORATION, DETROIT

CONDENSING UNITS

SEALED • OPEN

For Your Home—Remember Kelvinator Refrigerators, Electric Ranges, Water Heaters and Home Freezers.

feet per minute, while the fans circulate a total of 2,200 cubic feet through the coach.

Electric motor requirements for the complete installation include a 10 hp. on the refrigeration compressor, two one hp. fans for pulling the air through the refrigeration condensing coils, and two one-half hp. fans for circulating the air through the cooling and dehumidifying coils and filters and for drawing in the outside air.

S S S

JOBBERS COMPLYING WITH I.C.C. CYLINDER REGULATIONS

REFRIGERATION Supply Jobbers in the interest of safety are endeavoring to protect the service man and their own personnel by checking the Interstate Commerce Commission test date on all refrigerant cylinders brought in for refilling. Notices are posted in many jobber establishments informing the trade that refrigerant cylinders that have not been tested in the last five years are likely to be unsafe containers. Notices similar to the one shown here are being displayed.

NOTICE

In compliance with the ruling of the Interstate Commerce Commission, we will be unable to refill any cylinder with refrigerant unless the cylinder bears an I.C.C. test date less than 5 years old.

We will arrange to have your cylinders re-tested at $..... each or if desired you can send them direct to the.....

Company .....

EDITOR'S NOTE: We believe the refrigerant manufacturers in addition to several other companies throughout the United States are authorized to make tests on cylinders under I.C.C. regulations. Refrigeration Supply Jobbers have the names and addresses of these companies and will gladly supply them on request.

S S S

CASH FOR SERVICE POINTERS

MORE service information, the "down to earth" practical kind that will be of value to service engineers, is wanted. For all letters published from those who have tried and found their ideas successful, $5.00 will be paid. Address "Service Pointers," THE REFRIGERATION SERVICE ENGINEER, 433 N. Waller Ave., Chicago 44, Ill.

MASSACHUSETTS EXTENSION OFFERS COURSES IN REFRIGERATION

A COURSE in practical air conditioning for residences, restaurants, stores and offices will be given by University Extension, Massachusetts Department of Education, on Monday evenings, beginning October 15. There will be twelve lectures by P. A. L. Foulds, consulting engineer, of Hubbard, Rickerd & Blakeley, Boston. This course is intended for salesmen, designers, draftsmen and builders. It deals with the selection of equipment and calculations for the application of air conditioning to the various types named above. Capacity requirements for apparatus, pollution, temperature and humidity, control methods and devices are among the subjects considered.

An additional course will be given in household refrigeration, Friday evenings, beginning October 19. Leo F. Carton, installation and service supervisor for General Motors Sales Corporation will give the course of eight lectures. Both electric and gas units will be covered from the viewpoint of the installation and service man, with instruction on operation, installation and service and adjustments of various types.

Refrigerated sign built by Refrigeration and A.C. Dept. for farewell party given to Captain Storrs, U. S. Naval Air Station, Patuxent Rover, Md. Captain Storrs is congratulating Ernest E. Condon, member of R.S.E.S., on the display his department made for the party.

S S S

Otto Gehrt
Liberty, N. Y.

I find THE REFRIGERATION SERVICE ENGINEER very interesting and instructive and look forward to receiving each new issue.

STERLING REFRIGO GEL

The name to remember when specifying dehydrator refills

Inert, compact, efficient Silica Gel has almost completely replaced former more bulky materials as a drying agent for refrigerants. Because of its uniformity, high quality and long term dependability, Sterling Refrigo Gel is becoming increasingly recognized as a superior Silica Gel product for the exacting needs of the refrigeration industry. Especially processed from selected raw materials, Refrigo Gel maintains its uniform crystal size without powdering or caking. The entire pore surface is directed to the task of moisture absorption, blocking the possibility of channeling by the refrigerant. Remember this name, Sterling Refrigo Gel, when ordering factory-charged dehydrators or bulk refills from your jobber.

REFRIGO GEL
ADVANTAGES

Inert—no chemical reaction.

Uniform—no channeling.

Dustless—no clogging of screens

Tested—Designed, processed and tested for refrigerant dehydration.

Double duty—absorbs moisture, prevents corrosion.

Universal—effective with all types of refrigerants.

STERLING
REFRIGO GEL

Inquiries invited from distributors and jobbers

STERLING SILICA GEL COMPANY • STERLING, ILLINOIS

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Official Announcements of the activities of the International Society and Local Chapters appear in this department as well as articles pertaining to the educational work of the Society.

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To further the education and elevation of its members in the art and science of refrigeration engineering; for the reading and discussion of appropriate papers and lectures; the preparation and distribution among the membership of useful and practical information concerning the design, construction, operation and servicing of refrigerating machinery.

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We are NOW filling orders for

PEERLESS FLASH TUBE COILS
DE LUXE FLASH COOLERS

The entire refrigeration industry has been waiting for this announcement.

It marks the passing of priorities, delays and disappointments in serving your customers' coil and cooler needs.

Today . . . right now . . . you can place your orders for the famous *Peerless Flash Tube Coils* and *Peerless De Luxe Flash Coolers* and secure prompt delivery. Our fin coil machines are in operation, turning out volume production.

New war-born techniques and "know-how" are your assurance of finer *Peerless* quality than ever before.

Send for our new Bulletin No. 100. Bring yourself up-to-date on the exclusive features of *Peerless* coils which have made the name *Peerless* a synonym for *Superior Refrigeration*.

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CALGARY CHAPTER: President, W. H. Dowling, 827 5th Ave., N.W., Calgary, Alberta. Secretary, H. R. Dickieson, 802 16th Ave., West, Calgary, Alberta.

CANADIAN CAPITAL CHAPTER: President, F. Turner, 215 Lees Ave., E. Ottawa, Ont., Canada. Secretary, H. Boyle, Woodroffe, Ontario, Canada.

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ONTARIO MAPLE LEAF CHAPTER: President, Kenneth Wood, 2001 Bloor St., W., Toronto, Ont., Canada. Secretary, R. G. Henderson, 33 Bedford Park Ave., Toronto, Ont., Canada.

COMING CONVENTIONS

REMA Meetings and Convention

Fall meeting: November 7-8-9.

Place: The Homestead, Hot Springs, Va. Closed meeting for members only.

Spring meeting: March 4-5-6-7, 1946.

Place: Stevens Hotel, Chicago, Ill. Joint meeting with jobbers.

All Industry Exhibition:

Place: Cleveland Public Auditorium.

City: Cleveland, Ohio.

Date: October 28-29-30-31, 1946.

Exec. Secretary: R. Kennedy Hanson, 1107 Clark Bldg., Pittsburgh, Pa.

NRSJA Board of Directors Meeting

Date: October 29-30-31, 1945.

City: Chicago, Ill.

Exec. Secretary: H. S. McCloud, 920 E. McMillan St., Cincinnati 6, Ohio.

International Board of Directors R.S.E.S.

Place: LaSalle Hotel

City: Chicago, Illinois

Date: October 13-14, 1945

Secretary: H. T. McDermott, 433 N. Waller Ave., Chicago 44, Illinois.

Illinois State Association R.S.E.S.

Place: Hotel Rodgers

City: Bloomington, Illinois

Date: October 20-21, 1945

Secretary: Robert E. Saunders, 730 Towanda Ave., Bloomington, Illinois.

New England States Association R.S.E.S.

Place: Hotel Sheraton

City: Springfield, Massachusetts

Date: November 4, 1945

Secretary: R. R. Seddon, 13 Ronaele Road, Medford, Massachusetts.

INTERPROVINCIAL ASSOCIATION APPROVES APPRENTICESHIP ACT

THE following letter and report indicates the general trend toward raising the standards of the refrigeration service industry in the Province of Ontario, Canada. The Interprovincial Association of the Refrigeration Service Engineers Society, after information from many members had been received presented their request as follows:

Chairman,
Industry & Labor Board,
Department of Labor,
Toronto, Ontario.

On behalf of, and, in the interests of the employers and employees engaged in the refrigeration service industry in the Province of Ontario we request that you, under the powers vested in you, take the necessary steps to have the Apprenticeship Act extended to cover the refrigeration service industry.

The Refrigeration Service Industry as designated covers all employers and employees engaged in the installation, repair and maintenance of all types of domestic, commercial, and, air-conditioning mechanical refrigeration equipment.

The great majority of those now engaged in this industry believe that the extension of the Apprenticeship Act to cover their trade will prove to be of great benefit to all because:

1. It will enable the industry to set up a system of apparenticeship training.
2. It will protect those men presently engaged in this industry.
3. It will protect those men, now in the Armed Forces who were in the industry, and, who may, at time of discharge, wish to re-enter this industry.
4. It is the only means by which a certain definite standard of skill can be established to which all engaged in the industry must qualify.
5. It will protect, for all time, young men who may wish to enter this industry by providing them with an approved apprenticeship training leading toward a proper certificate of qualification.
6. It will protect the purchasing public, who should in a very short time, by advertising, and, other means know that the servicing of refrigeration equipment will be rendered by fully qualified men.

In support of this request we are enclosing herewith a sample copy of a questionnaire which was sent to all (to the best of our knowledge) those (some 342) engaged in the industry in Ontario. Also enclosed are the replies which we have received, a total of 266 —approximately 75 percent.

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Most errors in gauges are caused by distortion of the bourdon tube, which produces an improper relation between the tube and the movement. The conventional method of merely resetting the pointer does not correct this relationship. As a result the gauge may remain incorrect at certain points on the dial.

But the "Recalibrator" actually re-establishes the relation of the tube to the movement—actually does "re-calibrate" the gauge.

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Brooklyn 5, New York

These replies show:

In favor of extension		257
In favor of "licensing"		261
(In error the word "licensing" was used instead of the term "certificate of qualification").		
Against extension	6	
Against "licensing"	3	
Failed to state—extension	3	
Failed to state—"licensing"	2	266

We have, further, broken these replies down to terms of years in business, because after study, those men long in any industry are those most vitally interested, and, probably have the interests of the industry at large closer to their hearts and feelings than would others.

Years in business:

	Employer	Employee
3 years and under	5	38
4—6 years	5	14
7—9 years	20	14
10 years and over	77	72
Failed to state	8	13
	115	151

You will note that these replies come from all centers: Cornwall to Fort William; Toronto to Timmins; Ottawa to Windsor.

In addition to these questionnaires, meetings have been held in Toronto, London, Hamilton, and Kitchener. Further meetings are proposed for Windsor, Ottawa, and, Kingston. The purpose of these meetings was, and, will be, that an opportunity be given to as many engaged in the industry as possible to thoroughly discuss all matters; to ask questions, and, receive answers, pertaining to the Apprenticeship Act.

Every meeting has been an enthusiastic one and all present heartily endorsed the action of the Inter-Provincial Association, Refrigeration Service Engineers Society (a purely educational organization) in sponsoring the application now submitted to you, Sir, for consideration, and, we hope favorable action.

Yours very truly,
REFRIGERATION SERVICE
ENGINEERS SOCIETY,
President, W. H. Sneath,
Secretary, E. G. McCracken,
Interprovincial Association.

Report to Members

After the formal request to have the Ontario Apprenticeship Act extended to cover the Refrigeration Service Industry, the following report was made to the members:

This report is addressed particularly to those members living in Ontario. Those members living outside of Ontario may find it of interest, and, this is being forwarded to you to give an outline of what has been

done by your executive following the many requests made by the members that something be done along Apprenticeship lines.

To Secretaries of Chapters, outside of Ontario, who may, at some future date, be charged with the duty of obtaining further information regarding this problem, you may count on this office for any information, or assistance which we may be able to give you. Some time ago, a questionnaire covering the extension of the Apprenticeship Act and some form of Licensing was mailed to each Ontario member. As this problem was one which affected each and every employer and employee engaged in the installation, repair and maintenance of domestic, commercial and air-conditioning mechanical refrigeration equipment a copy was forwarded to all those whom we could find out were so engaged. It became, therefore, not an R. S. E. S. project, but, one for all; the R. S. E. S., as it has done in the past few years on so many other vital matters affecting Servicemen, acted in the interests of all.

Every questionnaire returned was checked for names of those not on our mailing list and to those who had not received a copy one was immediately mailed. We feel—therefore, that our coverage was as complete as it was possible to make. We sent out some 342 individual questionnaires. We have received back 266—about 75 percent.

With these figures before us we felt justified in following your instruction, and, on July 5, 1945, a brief was presented to the Chairman, Industry and Labor Board, Department of Labor, Ontario, requesting that the Apprenticeship Act be extended to cover the Refrigeration Service Industry. When we will be advised as to the decision we do not know, but, as soon as the decision is reached it will be made known to you.

One matter which we must clear up, on our questionnaire we used the term: "some form of Licensing." This was an incorrect term, as under the Apprenticeship Act a "certificate of qualification" is issued. It amounts to the same thing, and, will be covered in the Regulations which must be drawn up by the industry itself.

Many questions have been asked by members. It is impossible to cover them all, but, in a general way, and, as briefly as possible we will try to give you an idea as to how this Act works, and, some of the questions running through your mind may be answered.

Application is made to the Ontario Department of Labor to have the Act extended by representation from employers and employees. We assume that the application is granted. It then becomes necessary to appoint an Advisory Committee, consisting of at least five members (an equal number of employers and employees and a representative of the Department of Labor.) This Com-

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mittee then draws up regulations which control the operation. These regulations cover such matters as:

1. Term of Apprenticeship, including the time which must be spent at a recognized training school and the time to be spent in the field.
2. What, if any, examinations must be tried, and, passed.
3. What age limits are to be placed on applicants for apprentice training.
4. What subject must they study.
5. What divisions, if any, shall be made, such as domestic, commercial, shop-work, etc.

These are just a few points, but, you will note that the Industry itself controls the operation. Provided the regulations are not contrary to the general provisions of the Act, the industry itself and not the Government is responsible for the success or failure of its operation. It is granted that it will take some time before everything will become as it should be.

No one, presently engaged in the industry, and, who is a qualified man, need fear that he will suffer in any way. No thought, other than what we can do to put this industry on the basis that it should be, is, or, was, behind our effort. We only want to establish a definite basic standard of qualification for all, in or about to enter the industry.

The overwhelming majority of men engaged in our industry have stated their desires, and, as we stated we have carried out your expressed wish. If our applications is granted, the work is only started. All in the industry will be assuming a tremendous responsibility. We know that each and every one is prepared to accept their share of that responsibility.

E. G. McCracken, Secretary.

* * *

R.S.E.S. Chapter Notes

SAN DIEGO CHAPTER

San Diego, California, August 16—The meeting was held at the Anderson Refrigeration Service Building and was well attended. Members were notified of the Telephone Directory advertising program for the next issue. Two new applications for membership were presented and turned over to the Membership Committee for investigation and report at the next meeting.

The educational committee presented the first speaker of the evening, Mark K. Allen of Pacific Scientific Company, who is also a member of the Los Angeles Chapter R.S.E.S. Mr. Allen spoke at length on temperature and pressure control devices. He also answered questions in an open discussion which followed the talk.

CLEVELAND CHAPTER

Cleveland, Ohio, July 10—At the opening of the meeting, O. B. Herrick, Educational chairman discussed the programs to start in September. In the absence of the membership chairman a committee was appointed to act on three applications for membership. Plans were discussed for discouraging the public on calling several service companies with the hope of getting immediate service. Many trips were duplicated because of this practice. Publicity of this practice was suggested through the local newspapers.

August 21—The feature of this meeting was the showing of three very excellent sound films entitled: "Peoples of Canada", "Glacier National Park", and "A Sight-seeing Trip to New York City". The films were presented by Mr. and Mrs. Kolus and daughter. The next regular meeting was announced as a tube bending contest to be conducted by the Imperial Brass Co.

The second speaker of the evening, George Coombs of the California Electric Works, San Diego's largest motor repair center, then gave a talk on the use and maintenance of refrigeration motors. At the conclusion of his talk Mr. Coombs filled out an application for Associate membership in the chapter. An open discussion of the problem of sub-standard appliances and wiring was held and many interesting points were brought up. At the close of the meeting sandwiches and drinks were served by the courtesy of the entertainment committee.

LONGBEACH CHAPTER

Long Beach, Calif., July 11—The meeting was devoted to election of officers with the following results: Leslie Gould, *President;* Everett Brown, *Vice President;* Arnold Shinnerer, *Treasurer;* Pat Riley, *Secretary;* Tom Ringrose, *Sergeant-at-arms.* Following the election, refreshments were served by Garrit Van Ginkle, assisted by the new officers.

August 8—The educational part of the program was an open discussion on low temperature defrost systems and converting sulphur systems to Freon-12. A motion picture of the war was then shown, after which refreshments were served.

SOUTHERN OHIO CHAPTER

Portsmouth, Ohio, Aug. 22—This meeting was arranged as a chicken dinner attended by members and their wives. The dinner was held at Lake White, Waverly, Ohio. After dinner, a round-table discussion was held on the peace time plans of the refrigeration service engineers present. Attending the meeting on his furlough was Carl Ackley of the Seabees, a member of the chapter.

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MILE HIGH CHAPTER

Denver, Colorado, July 9—Twenty-one members assembled for the meeting where the suggestion from the Service Improvements Advisory Committee on manufacturers inserting a parts list with each product was discussed and approved. President Barley then appointed the following committees: H. R. McCombs, membership; W. F. Hemphill, Lyle Smith, and T. E. Ericcson, educational. These two committees were instructed to arrange the programs for the year and submit a budget for the execution of the program. Additional committees appointed were: Roy Roush and Leonard Martin, refreshments; Charles Connell, Gene Rinehardt, and Russel Gritton, sick and visiting. Ernie Martin was again appointed as Picnic chairman to arrange for the picnic in August.

MIAMI CHAPTER

Miami, Florida, August 8—A general discussion on the chapter by-laws was the major topic of the meeting. Fourteen new members were accepted to membership. After the meeting, motion pictures were shown.

August 22—At this meeting, a representative of the Federal Apprenticeship Training Committee spoke on the methods and requirements to train men to become good service engineers. Election of the balance of the chapter officers was held with the following results: A. L. Bizzell, *Treasurer;* W. T. Pike, *Vice Secretary*. Two applications for membership were read and referred to the membership committee.

Officers of Niagara Frontier Chapter and others at the annual banquet meeting. Standing (left to right), J. Bush, M. J. Wroblewski, L. A. Schanke, C. A. Schintzius, E. Orsolitz. Seated, W. L. Goeckel, R. Davis, C. Buschkopf, J. Muller

BOSTON CHAPTER

Boston, Mass., July 10—The meeting was called to order by Bertil Stenmark. Applications for the following men were approved for membership: R. E. Sawers, J. W. Chamberlain, Jr., J. F. Wilson, J. J. Losardo, H. H. Holmes, C. A. Pockwinse, E. J. Sherman, G. J. Savageau.

William Paulin, Educational Chairman, introduced Stanley T. Johnson who presented the story of the V belts from their beginning and followed through with present day applications.

Members and ladies of Niagara Frontier chapter and their guests enjoy annual banquet.

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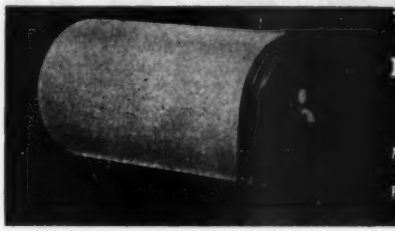

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OIL CAPITOL CHAPTER

Tulsa, Okla.—Preparing a real affair for the members in and around Tulsa, Okla., the Chapter's Entertainment Committee has announced its annual picnic for September 22. One of the unique features of the affair is that it will be held on the farm of W. R. Chilton, a Chapter member. Mr. Chilton has all the facilities for such an outing, including a barbeque pit, open furnaces for cooking, tables and chairs, and plenty of space for all. Adjoining the Chilton farm is a public school grounds where the kiddies can amuse themselves with the playground equipment.

An all-out attendance is expected at the expense of the Chapter. The Entertainment Committee suggests no service appointments be made for that day with the hope that nothing extremely urgent will interfere with the good time planned for all. At least half a day is suggested for those who are needed for urgent calls. The notice mailed to each member gives full details on how to get to the chosen picnic site together with additional remarks from the secretary.

GOLDEN GATE CHAPTER

San Francisco, Calif., Aug. 9—The first regular meeting was held with members from many service companies represented. Officers elected for the year were: John Schlemmer, *President;* Eugene Larsen, *First vice-president;* Larry Jensen, *Second vice-president;* Rowland Cooke, *Secretary;* Arthur Frazier, *Treasurer;* Harold Beck, *Sergeant-at-Arms;* George Eskra, *Educational Chairman.*

KEY CITY CHAPTER

Dubuque, Ia., July 11—The meeting was opened by T. H. Glass, president, after which a talk, by Albert Henkler on the use of Westinghouse Sterilamps, was delivered to those present. The talk was followed by election of officers for the year. Those elected were: T. H. Glass, *President;* Paul Fondell, *Vice President;* Wilfred Nestor, *Secretary-Treasurer;* Earl Engler, *Sergeant at Arms.*

August 1—At this meeting, a letter was read from the Davenport Chapter inviting the membership to attend a picnic at Davenport, Ia. Progress on the formation of the Iowa State Association was reported. Further business brought to the attention of those present was the possibility of a city ordinance governing refrigeration work.

WOLVERINE CHAPTER

Lansing, Mich., July 9—The meeting was called to order by President Lockwood for the purpose of electing officers. Officers elected were: Sidney Ferrin, *President;* Albert Gary, *Vice-President;* Lester Lockwood, *Treasurer;* John Bush, *Secretary;* Charles Palmer, *Sergeant-at-Arms.* Two Junior members were accepted by the Chapter. They were: John and Howard Rundle.

August 27—The meeting was opened by the new President, Mr. Ferrin. In addition to changing the method and time of paying dues, a discussion was held on plans for a banquet to be arranged for the latter part of September. Mr. Ferrin accepted the responsibility of locating an appropriate place.

The group of men attending Golden Gate Chapter meeting. Officers are shown as indicated: 1. John Schlemmer, President; 2. Arthur Frazier, Treasurer; 3. Rowland Cooke, Secretary; 4. Eugene Larsen, First Vice-president; 5. Harold Beck, Sergeant at Arms; 6. Richard Deems, Membership; 7. Larry Jensen, Second Vice-president; 8. George Eskra, Educational.

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FREE FACTS

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1314 W. Belden Ave.
Dept. 45, Chicago 14, Ill.

Please give me more information about Refrigeration and Air Conditioning Training, as promised in your "Refrigeration Service Engineer" September 1945 advertisement.

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Ladies Auxiliary

KANSAS CITY AUXILIARY

Kansas City, Mo., July 11—The ladies met for a short business session in which birthday cards were signed for R. E. Meeker and Frank Brown. After financial and other matters were attended to, the meeting adjourned and all enjoyed playing pinochle.

August 11—Correspondence was read from Mrs. Glen Dresback, National Auxiliary President, and Mrs. Overman, National Secretary. Mrs. Hoover was appointed to phone new members and invite them to meetings.

TWIN CITIES AUXILIARY

Minneapolis, Minn., August 7—After the regular order of business, it was decided to have a wiener roast in September. Mrs. Phillips and Mrs. Holmes were appointed to make arrangements for the outing to be enjoyed by the ladies and their husbands. Plans were made to extend an invitation to wives of all R.S.E.S. Chapter members to attend the October meeting. After the meeting, the members joined the Twin Cities Chapter to see a motion picture which included those taken at the recent picnic.

ROCKFORD AUXILIARY

Rockford, Ill., June 18—At this meeting the annual election of officers took place. Those elected were: Mrs. Walter W. Larson, *President;* Mrs. R. Clyde McCarthy, *Vice President;* Mrs. Russell Robertson, *Secretary;* Mrs. Arthur Overman, *Treasurer;* Mrs. Robert Weygant, *Sergeant-at-arms.* After the meeting, refreshments were served with Mrs. Walter Larson as hostess for the balance of the evening. Three new members were reported for the year. They are: Mrs. D. E. Sibert, Mrs. R. Robertson, and Mrs. R. Weygant.

Niagara Frontier Ladies Auxiliary display their Charter. Left to right, Mrs. H. Keirn, Mrs. W. Goeckel, Mrs. W. Bobzien, Mrs. E. Orsolitz, Mrs. J. Muller.

REMA ALL-INDUSTRY EXHIBIT SET FOR CLEVELAND, OCTOBER, 1946

FOLLOWING a meeting of the REMA board of directors, held in Marinette, Wis., on the day the Japs gave up, it was announced that the association would resume its annual all-industry refrigeration and air conditioning show in the Municipal auditorium in Cleveland, Ohio, October 28, 29, 30, and 31, 1946. A quarter of a million square feet of floor space, sufficient for at least 250 separate exhibits, will be used, thus making the display at least three times larger than any all-industry show held before the war.

A Fall closed meeting will be held in Hot Springs, Va., November 7, 8 and 9, 1945. Among the subjects to be discussed is that of repricing. One day of the meeting has been set aside for this discussion at which a representative of OPA will be present to answer questions.

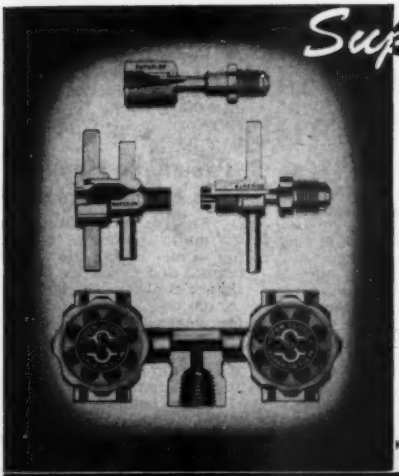
The annual REMA Spring meeting will be held at the Stevens Hotel, Chicago, March 4, 5, 6 and 7, 1946. Conference type booths will be set up in the Exhibition Hall to provide jobbers, service men, manufacturers and others an opportunity to confer with REMA members.

NEW CHAPTERS GET CHARTER

THREE newly formed chapters in the West are to receive their charters this month: W. W. Allison, RSES Director, will present charters to Multnomah Chapter, Portland, Oregon, on September 17; Golden Gate Chapter, San Francisco, California, September 20, and Sacramento Valley Chapter, Sacramento, California, September 21.

LILLEY & SON

FLOYD LILLEY, president of Chicago Chapter, announced the arrival of Mark Hillyard Lilley on August 30. Son and Mrs. Lilley are doing well from reports received through Floyd. Mark is the Lilley's second child, their first is Mother's little helper and now Floyd has someone who can run errands for him in the not too distant future.



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QUICK-COUPLERS

Exactly what the name implies—handy little swivel connectors for "quick-coupling" charging lines, gauge lines, vacuum lines, pressure lines, etc. to refrigeration cylinder valves, gauge sets, compressor service valves, evaporators, condensers and other equipment, *without the use of a wrench.*

Made in three styles—(1) For charging and gauge lines for field or shop service, or factory production equipment; (2) test hook-ups for evaporators, condensers, controls, etc.; (3) for testing equipment where only a tubing connection is provided for attaching.

No. 17

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Fond du Lac, Wisconsin
SANITARY Quicfrez

New and Improved Appliances

Information contained in this department is furnished by the manufacturer of the article described and is not to be construed as the opinion of the Editor.

Charging Hose and Connections

A COMPLETE line of hose for all fluids and detachable-reuseable fittings has been announced by the Aeroquip Corporation. The type 1506 low pressure hose has minimum bursting pressures of 700 psi. for the ⅝ inch copper tube size and 1500 psi. for the ¼ inch copper tube size. Type 1501 medium pressure hose is designed for pressures of 6500 psi. to 3250 psi. in sizes ranging from ¼ inch to ¾ inch. The high pressure type ranges from one inch to two inch O.D. tube sizes with bursting pressures of 3500 psi. and 1500 psi. respectively.

Aeroquip fittings and hose may be purchased separately for easy assembly on the job. An assortment of standard S.A.E. flare and iron pipe nipples are available for detachable or permanent connections.

In addition to the regular fittings the company manufactures self-sealing couplings making it possible to separate and reconnect liquid or gas filled lines without the loss or introduction of air into the system.

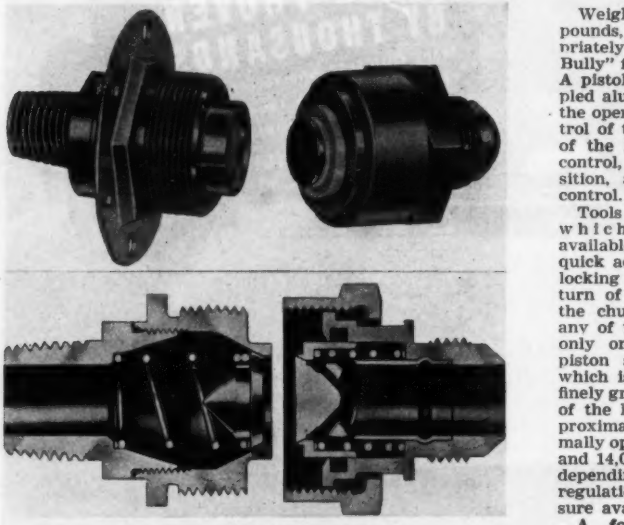


Diagram Photo of Aeroquip hose fittings.

The "Bantam Bully" Pneumatic Hammer

Pneumatic Hammer For Metal Working

A SMALL, powerful pneumatic hammer, delivering some 13,000 blows per minute and operating on less than 2 cubic feet of air at 80 to 100 PSI, will be released for general distribution according to announcement by the manufacturer, Superior Manufacturing Company, Public Square Building, Cleveland 13, Ohio. Originally designed for special applications, where an exceptionally small tool with plenty of power and long lasting qualities were demanded, the air hammer has heretofore been sold by the manufacturer almost exclusively to war production plants.

Its performance record led to the company's decision to expand production of the hammer for postwar use.

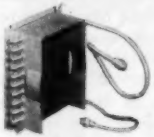
Weighing less than two pounds, the hammer, appropriately named the "Bantam Bully" fits easily in the hand. A pistol grip handle, of dimpled aluminum casting, gives the operator comfortable control of the rapid-firing power of the hammer. The valve control, in pistol trigger position, adds to the ease of control.

Tools for the hammer, of which a wide variety are available, are loaded in a quick acting ball-and-channel locking chuck. A quarter-turn of the knurled nose of the chuck locks or releases any of the tools. It has but only one moving part, the piston striking member, which is precision-fitted in a finely ground cylinder. Travel of the hammer piston is approximately ⅜ in. and normally operates between 12,000 and 14,000 blows per minute, depending upon the trigger regulation and the air pressure available.

A four-page bulletin is available from the company.

LOOK—Genuine GRUNOW PARTS at These Discounts!

11234-5 Carrene Meter
(list) $11.50
(net) 5.75



9851-A Radistor Condenser
(list) $11.00
(net) 5.50

5745 Relay
(list) $4.00
(net) 2.00

Stator
(list) $13.00
(net) 6.50

10949 Fan
(list) $9.00
(net) 4.50

10200 Float Meter
(list) $8.00
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10708 Thermostat
(list) $9.00 (net) 4.50
(10 lots) 4.35

These discounts apply only on orders of $25.00 or more. Write for price sheet and catalog.

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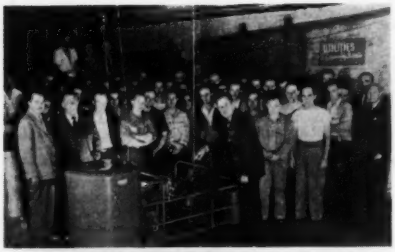
UTILITIES ENGINEERING INSTITUTE ADDS SUB-ZERO CHILLER TO EQUIPMENT

INDICATIVE of the way the training of future refrigeration servicemen is keeping pace with significant trends in the field, Utilities Engineering Institute has added to its quick-freezing and low-temperature training equipment to include the latest type Deep Freeze Cascade, —120° F. industrial sub-zero chilling machine, in its shops in Chicago. After installation by the school's staff of technicians, the honor of starting the machine on its first official run as a regular part of the school's training equipment was given to Mr. S. J. Seibert, Manager of the Industrial Division of the Deep Freeze Division of Motor Products Corporation, makers of the unit.



Newly installed Deep Freeze —120° F. Cascade unit at Utilities Engineering Institute in Chicago is officially started by S. J. Seibert (in front of machine), Deep Freeze official. Audience includes men in training at the school, and U.E.I. president and vice president, E. P. Sorenson and W. H. Hoehne (front row, left).

To an audience of men which included the school's president, E. P. Sorenson, and vice president, W. H. Hoehne, and students from many parts of the United States, Mr. Seibert delivered a lecture covering many service and maintenance problems in connection with industrial sub-zero temperature work.

S S S

STERLING SMITH LEAVES MILLS

STERLING SMITH resigned his position as manager of the Refrigeration Division, Mills Industries, Chicago, effective September 1. Prior to his association with Mills, he was Chief of the Refrigeration and Air Conditioning Section of the General Industrial Equipment Division, WPB. Before going with WPB, Mr. Smith was with Nash-Kelvinator in New York.

DAY & NIGHT ENTERS NEW REFRIGERATION FIELDS

NEW products, developed during the war period have been announced by Day & Night Mfg. Co., Monrovia, Calif, which will open to them new fields in the refrigeration industry. Previously and throughout the war period, Day & Night made low sides and cabinets for drinking water coolers, as well as insulated tank coolers for many industrial uses.

According to R. O. White, manager of the cooler division, soon to be introduced to the trade, will be a line of self contained, cabinet drinking fountain coolers. This will be the first offering by the company of a complete, packaged, water cooler unit.

Another item soon to be announced, says Mr. White, is a new laboratory development which will be known as Flash Kold Sheets. Designed to replace fin coils, Flash Kold Sheets are claimed to offer greater effective cooling surface, lower cost and space saving installation advantages. These units will be made in sizes adapted for use in locker and food processing plants, deep freeze and beverage dispensing cabinets and commercial refrigerators of all types.

S S S

LINEHAN JOINS PENN'S CHICAGO OFFICE

THE addition of Lester D. Linehan as sales engineer for the Penn Electric Switch Company's Chicago office at 520 N. Michigan Ave. has been announced. He will work with E. B. Maire, manager of Penn's Chicago branch.

LESTER D. LINEHAN

Educated at the University of Illinois and Armour Institute of Technology, Mr. Linehan was a heating sales engineer for 15 years for the Peoples Gas Co. in Chicago. Previous to joining Penn, he was a field engineer for two years with U. S. Electrical Motors, Inc.

Penn manufactures a complete line of automatic controls for heating, refrigeration, pump and air compressor service as well as safety controls for internal combustion engines.

WRITE FOR CATALOG

Due to the paper shortage we will not issue a catalog in 1945.

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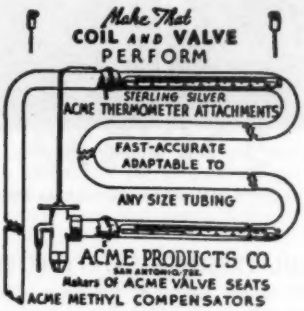

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NEW CONTROL DEPARTMENT ANNOUNCED BY HONEYWELL

FORMATION of a new division known as the Commercial Controls Department with John E. Haines as manager, has been announced by C. B. Sweatt, vice president, Minneapolis-Honeywell Regulator Company, Minneapolis, Minn. As part of the reorganization of the company's sales department, those sales divisions which are more concerned with commercial type of controls have now been brought under supervision of the new department, he said.

JOHN E. HAINES

Mr. Haines, who until his new appoint ment had been manager of the comany's air conditioning controls division, joined Minneapolis-Honeywell in August, 1929. A graduate of Purdue University, where he received his degree in chemical engineering, Mr. Haines became assistant manager of the Modutrol division in 1934 and subsequently served as manager of the national regulator division until his appointment to the air conditioning controls division in 1940.

The commercial controls department encompasses six sales divisions, Mr. Sweatt said. Those are: air conditioning controls division, Moduflow division, railway controls division, apartment controls division, refrigeration controls division and the aeronautical division.

Mr. Sweatt also announced the promotion of two new zone managers in the air conditioning controls division. They are H. R. Canoyer as sales manager of the Central Zone with headquarters in Cleveland and M. S. Hamilton, as sales manager of the Southeastern Zone with headquarters in Atlanta.

S S S

CORRECTION

THROUGH an error captions of two of the portraits illustrating the announcement of the Kerotest Manufacturing Company opening a new Pacific Coast warehouse in the August issue were transposed. The portrait of J. A. Norris had J. A. Swaton's name under it and the portrait of Mr. Swaton's had Mr. Norris' name under it.

JOBBER DEMONSTRATES HANDLING OF REFRIGERANT CYLINDERS

ON a proverbial postman's holiday the first part of July, J. M. Oberc, Detroit jobber, visited Ansul Chemical Company, Marinette, Wisconsin, and during his stay took time out to show the Ansul crowd that when it comes to filling and shipping cylinders of refrigerant gas he knows what it is all about. Joe was quick to observe from his trip through the plant that Ansul cylinders are not idle long. The four shots of

Joe show him (1) Rolling his own, (2) Checking the weight, (3) Arranging delivery and (4) Getting the cylinder on its way.

S S S

ANSUL PRESENTS SAFETY POSTER

THE Ansul Chemical Company, Marinette, Wisconsin, has prepared a safety poster on the filling of refrigerant cylinders. The poster shows the terrific pressure imposed on an overfilled cylinder when the liquid expands. Additional diagrams illustrate the effect of temperature increase on properly filled cylinders. Ansul is sending these posters to all refrigeration supply jobbers and is supplying the field men with them to be distributed among refrigeration service organizations.

"We hope that this effort on Ansul's part will make the serviceman more conscious of the dangers of overfilling drums," says George Vermilye, assistant sales manager.

WAR-VE-VJ-RECONVERSION

Four major changes in the last four years brings the important task of pursuing peace-time activities.

We are catching up with the latest changes in industry. New shipments are being received daily from which to fill your orders. Ask us for those parts and tools you have been needing.

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Equipping a new Serviceman
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FEDDERS APPOINTS MORGAN CHIEF ENGINEER

THE appointment of Robert W. Morgan as chief engineer of the Fedders Manufacturing Co. Inc., of Buffalo, N. Y., was announced recently by E. R. Walker, Vice President.

ROBT. W. MORGAN

Mr. Morgan will direct all engineering activities at Fedders. The Fedders line of products is being expanded for postwar markets covering household and commercial refrigeration, heating, air conditioning, water cooling. automotive radiators, engine and oil coolers for aircraft and other allied products. The company now has the largest engineering staff in its history, and further additions are being made to its personnel to handle engineering work including research, product development and design, testing and production.

Laboratory and testing facilities at the Buffalo plant have been expanded, and provide a complete and well equipped set-up. One example is the large dual wind tunnels capable of reproducing an infinite number of conditions involving high and low temperatures, air speeds and pressures.

COMMERCIAL TRADES TO GIVE REFRESHER COURSE

REALIZING the benefit of technical training for service men, H. E. Wheeler of Air Comfort Corporation has arranged with Commercial Trades Institute of Chicago to outline a series of topics dealing with maintenance and service of air conditioning equipment. A weekly meeting of the service organization will be held at which time the Instruction staff of Commercial Trades will present the topics they have prepared.

The announcement of the training program was made jointly by H. E. Wheeler of Air Comfort Corporation and R. C. Anderson of Commercial Trades Institute. Mr. Wheeler believes the training his men will receive will materially aid them in giving the users of air conditioning equipment much greater satisfaction in the performance of air conditioning installations.

SUPERIOR VALVE APPOINTS NEW EASTERN DISTRICT MANAGER

THE appointment of Mr. R. C. Robertson as manager of their Eastern District Office has been announced by Superior Valve & Fittings Co., Pittsburgh, Pa. Mr. Robertson joined Superior on June 16 and will handle sales in the eastern states from Maine to North Carolina, taking in the eastern half of New York and Pennsylvania.

R. C. ROBERTSON

During his 19 years of experience in the refrigeration and air conditioning industry, he has been commercial regional supervisor of York Corporation, dealer supervisor of Carrier Corporation, and more recently in the Airtemp Division of Chrysler Corporation as assistant general sales manager and New York manager of the National Accounts Department. Mr. Robertson has been a member of A.S.R.E. since 1935 and has served as chairman of the New York Section of that organization. He will make his headquarters at 60 East 42nd Street, New York City.

CHARLES RUSSELL DECEASED

FORMER business associates and numerous personal friends as well as immediate members of the family, paid final tribute to Charles P. Russell, 52, of Airtemp Division, Chrysler Corporation, at funeral services in Detroit Thursday afternoon, August 2. Mr. Russell died in Detroit July 30 after a short illness. He was staff engineer in the cooling department of the Airtemp Division, Dayton, at the time of his death. He joined the Chrysler Corp. in Detroit in 1938 and later was transferred to the Airtemp Division in Dayton.

The Late Chas. P. Russell

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Complete Stocks of Refrigeration Supplies, Motors, and Motor Parts, Lyon Metal Shop Equipment—Everything to meet the refrigeration serviceman's requirements. We feature one-stop Supply service and same day shipment of your orders.

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PUT RUST TO WORK!

Brush or spray Nobs Glazecoat directly on rust. Rust aids in forming a permanent thermo-plastic coating that is not affected by water, alcohols, dilute acids, or alkalies. Prevents further rusting. Stands heat to 400° F. Covers about 300 sq. feet per gallon.

Price.....$3.50 per gal. F.O.B. Los Angeles

NOBS CHEMICAL COMPANY
2465 East 53rd Street, Los Angeles 11, Calif.
Seattle San Francisco

GARY RETURNS TO HENRY VALVE

AFTER serving as a Lieutenant in the United States Navy for many months, Charles B. Gary has received orders for inactive duty in the United States Naval Reserve and has returned to the Henry Valve Co., Chicago, as general manager. Henry Valve manufactures valves, fittings and other products for the refrigerating industry. Mr. Gary has served as a Lieutenant in the USNR since 1942, and prior to being placed on inactive duty had been in the Pacific theater of operations.

SELLS SNOW TO ESKIMOS!

YOU'VE heard about selling ice to Eskimos. Well, the Alaska Electric Light & Power Co., of Juneau, Alaska, is in a position to do just that.

Front view of Alaska Electric Light & Power Store, Juneau, Alaska.

Of course, Juneau enjoys about the same temperature as we do and being the strictly up-to-date community that it is, needs its refrigeration and air-conditioning conveniences as much as do folks anywhere else. The storage of fresh vegetables and perishable foods is as much or more of a problem there than it is in the states.

The Alaska Electric Light & Power Company, of Juneau, occupies a modern, streamlined structure in Juneau, and carries a full line of "A-P" Refrigerant Valves and Controls as well as other products bearing the "A-P" trademark, manufactured by the Automatic Products Company of Milwaukee, Wisconsin.

RANCO OPENS MICHIGAN OFFICE

C. E. WHIPPS, former manager of the order department at Ranco Inc., has been named to head an office which will serve the Michigan area for the company. His new address is 2833 Pittsfield Blvd., Pittsfield Village, Ann Arbor, Michigan. Mr. Whipps is well known to members of the refrigeration trade, having been connected with Ranco Inc., for a number of years.

C. E. WHIPPS

SERVEL APPOINTS BELL AND OLIN REGIONAL MANAGERS

THE appointment of Harry F. Bell and Carl L. Olin to Eastern sales manager and Western sales manager, respectively of the Electric Refrigeration Division of Servel, Inc., Evansville, Ind., has been announced by W. J. Aulsebrook, sales manager. Mr. Bell, who has been connected with Servel Inc. since 1936, was formerly with the company's Boston distributor. He will handle all field contacts east of the Illinois-Indiana line. Carl L. Olin, with Servel since 1926, started with the company on the West Coast as field service engineer.

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One Year Guarantee
Each Control Reset and Cycle Tested

Domestic Cold Controls (Modern Type)	$2.00
Commercial Controls (Pres. or Temp.)	2.50
Commercial Dual Controls	3.00
Automatic Water Valves	2.00
Automatic Expansion Valves	1.75
Thermostatic Expansion Valves	3.00

All Prices F.O.B. Chicago and subject to change without notice.

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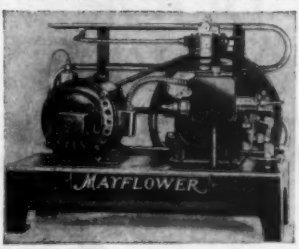

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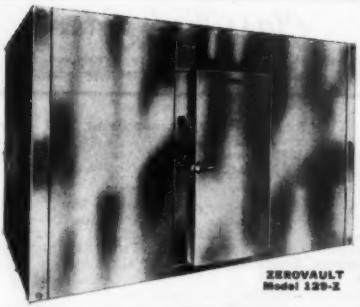

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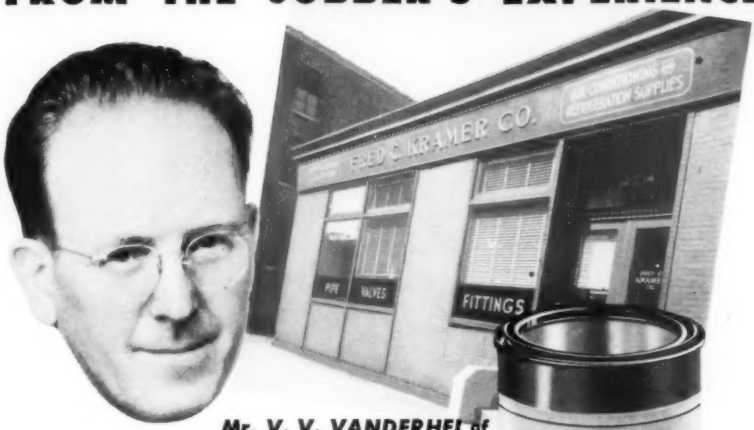

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